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January 9, 2004

Michael Sclafani, Wetlands Council Clerk
Department of Environmental Services
6 Hazen Drive
PO Box 95
Concord, NH 03302-0095

Re: Town of Nottingham Selectmen's Notice of Appeal 04-01 WC

Dear Mr. Sclafani:

Enclosed for filing with the Water Council, please find an original and twenty (20) copies of the Notice of Appeal.

Thank you for your attention in this matter.

Very truly yours,

E. Tupper Kinder

ETK/sma
Encls.
cc: Michael Nolin, Department of Environmental Services
Harry T. Stewart
Mark E. Beliveau, Esquire
Gregory H. Smith, Esquire
Richard W. Head, Esquire
Armand M. Hyatt, Esquire
Town of Nottingham
Town of Barrington
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JAN 09 2004
04-01 WC

The State of New Hampshire

Department of Environmental Services
Water Council

In Re: Application of USA Springs, Inc. for a Large Groundwater Withdrawal Permit and Approval of Bottled Water Source

TOWN OF NOTTINGHAM SELECTMEN'S NOTICE OF APPEAL UNDER ENV-WS 389

Introduction

The Town of Nottingham Selectmen, acting on behalf of the citizens of the Town of Nottingham for the purpose of protecting public resources and interests, appeal the decision made by the New Hampshire Department of Environmental Services dated December 11, 2003 which denies the application of USA Springs, Inc. for a large groundwater withdrawal permit in accordance with Env-Ws 388 and denies the request for approval of a new source of bottled water in accordance with Env-Ws 389. This appeal addresses the Department's findings with respect to the application under Env-Ws 389. Under Env-Ws 389.20, all new source approvals are contingent on compliance with the provisions of RSA 485-C:4 and Env-Ws 388. While the Selectmen agree with the Department's decision denying the application because of the deficiencies in the USA Springs' submittals relative to uncontrolled contamination sources, the Selectmen are aggrieved with respect to certain findings of the Department which appear to hold that USA Springs' submittals are consistent with the requirements of RSA 485:3, RSA 485-C, Env-Ws 388 and Env-Ws 389 in other respects.

The Selectmen appeal because to the extent that the Department has found the USA Springs' submittals to be consistent with the above statutes and regulations, such findings are arbitrary, capricious and unlawful and do not address the recommendations submitted by the

Nottingham Selectmen as required by RSA 485-C:21. It is the Selectmen's belief that these findings should be corrected before the Department begins consideration of the USA Springs' new application for essentially the same project, which was filed on December 29, 2003 and relies on the information which accompanied the previous application.

This appeal is based on four points.

1. The Department failed to provide written findings with respect to recommendations of the Nottingham Selectmen and their expert which are contrary to the Department's decision, and this action is arbitrary, unreasonable and directly contrary to the provisions of RSA 485-C:21.

2. To the extent that the Department found that the USA Springs' submittal is consistent with law and regulations (except as to the uncontrolled contamination source), such finding is arbitrary, unreasonable and unlawful.

3. To the extent that the Department found that water quantity issues (that is setting the maximum limits for withdrawals) can be resolved by the monitoring and mitigation proposal of USA Springs instead of by accurately evaluating complete and correct data, such finding is arbitrary, unreasonable and unlawful.

4. The Department's finding that the USA Springs' final report dated February 3, 2003 and the supplemental material submitted adequately demonstrates a need for the proposed withdrawal and that the water will be utilized in an efficient manner is arbitrary, unreasonable and unlawful.

Summary of the status of this matter.

USA Springs, Inc. submitted an application for a large groundwater withdrawal permit under Env-Ws 388 and a new source of bottled water under Env-Ws 389 on or about May of 2001. The application proposed to withdraw up to 439,200 gallons per day. After a number of exchanges of technical comments and revised preliminary applications, USA Springs submitted its final revised preliminary application on July 18, 2002. The Nottingham Selectmen submitted comments dated August 12, 2002 (Attachment A). The Department issued its technical comments on the revised application on September 11, 2002. USA Springs conducted a withdrawal test from November 19 through November 29, 2002.

On February 4, 2003, USA Springs submitted the final report for large groundwater withdrawal. On April 11, 2003, the Department issued its preliminary technical comments. The Nottingham Selectmen presented comments on the final report dated March 14, 2003 (Attachment B) and July 15, 2003 (Attachment C). On August 12, 2003, the Department denied the approval for a large groundwater withdrawal permit under Env-Ws 388 and a new source of bottled water under Env-Ws 389. The decision set forth that, in almost every respect, the information submitted by USA Springs was incorrect and incomplete and was inaccurately interpreted such that the report could not form a reliable basis for a grant of a permit. On September 11, 2003, USA Springs submitted a motion for rehearing with attached information. USA Springs submitted a response to the August 12, 2003 decision and subsequently submitted additional information on or about September 29, 2003 and November 10, 2003. During a public comment process, the Nottingham Selectmen presented comments dated October 29, 2003 (Attachment D) and December 3, 2003. (Attachment E). On December 11, 2003, the

Department issued its final decision following the rehearing process denying the application under Env-Ws 389.

Basis for Appeal.

The Town of Nottingham relies on groundwater as the sole source of drinking water in town. The Town is growing and the number of groundwater users in the vicinity of this proposal is expected to continue to grow. The State of New Hampshire has recognized that the groundwater is a public resource and that local communities have a recognized interest in the protection of these groundwater resources. (See RSA 485-C:1). RSA 485-C establishes a regulatory review process which recognizes the important role that municipalities play in large groundwater withdrawals and requires any decision of the Department to specifically address comments of the municipality. (RSA 485-C:21)

On August 12, 2003, the Department found that the data presented by USA Springs was incorrect and incomplete and was inaccurately evaluated by the applicant. (NHDES Decision August 12, 2003). The Department also found that even though USA Springs had agreed in advance that the withdrawal test was to be terminated in the event of a one inch rainfall event and that the flow rates were to remain constant, USA Springs continued the withdrawal test even though the precipitation criteria and varying extraction rate criteria were not adhered to. (December 11, 2003 at 4). During the test, USA Springs altered the flow rates of all three of its production wells, thus introducing an additional variable into the withdrawal test and reduced the cumulative withdrawal rate by almost 30%.

The Department has also found that the USA Springs withdrawal test "demonstrated that

more total impacts and more impacts over a greater distance occurred" than for any other similar large groundwater withdrawal permit application reviewed by the Department. (NHDES Decision, December 11, 2003 at 4). This was true even though the number of competing water users and water resources in the region was much lower for the USA Springs site than comparable sites. The Department also found that the hydrologic conceptual models described in the USA Springs' final report presented two conflicting conceptual models, and that USA Springs has not amended its application to correct the contradictions. (NHDES Decision, December 11, 2003 at 9). The Department found

> "While it appears that the withdrawal proposed by USA Springs will likely reach equilibrium, the degree that the withdrawal will affect storage, recharge or discharge at equilibrium will depend on aquifer properties, boundary conditions, the magnitude of the proposed withdrawal, and the nature and extent of recharge. A water budget analysis does not collectively assess these elements. The withdrawal test for USA Springs demonstrated that the proposed withdrawal will partially dewater bedrock and over burden aquifers necessitating the development of an acceptable monitoring, reporting and mitigation plan." (NHDES Decision, December 11, 2003 at 10).

Finally, even though the Department recognized that a prime wetland, properly designated by the Town of Barrington, was immediately adjacent to the groundwater withdrawal activity and was demonstrated to be effected adversely by the proposed pumping, the Department failed to require the applicant to demonstrate by clear and convincing evidence that the prime wetland values would not be adversely effected as required by RSA 482-A:11(iv).

First ground of appeal.

The Department's decision failed to include written findings specifically related to recommendations presented by the Nottingham Selectmen.

As indicated above, the Nottingham Selectmen provided written comments on August 12,

2002, March 14, 2003, July 15, 2003, October 29, 2003 and December 3, 2003. (See Attachments A, B, C, D and E). RSA 485-C:21(v) specifically mandates that the Department address in writing recommendations of municipalities which are contrary to findings of the Department. The clear purpose of the requirement is to assure that municipal recommendations are specifically considered and that a technical review is performed prior to rejecting those recommendations. Just a few examples of Nottingham's recommendations are listed below:

1. The August 12, 2002 comments recommended that an understanding of the hydrologic system be established before a pumping test was performed and before any data could be accurately interpreted.

2. The August 12, 2002 comments recommended wetland monitoring over a longer period of time than 30 days prior to the pumping test to have an accurate appreciation of impacts on the wetland ecosystem.

3. The March 14, 2003 comments recommended that the data should be interpreted to demonstrate flow in the overburden at 5000 gpd and in bedrock at 194,000 gpd, thus showing there was insufficient flow for the proposed withdrawal.

4. The March 14, 2003 comments recommended that the requested withdrawal rate (309,000 gpd) would significantly dewater prime wetlands and create excessive drawdown in private wells.

5. The March 14, 2003 comments recommended that, given the predictable adverse consequences and the high uncertainty due to unreliable data, the request should be denied or the withdrawal limited.

6. The July 15, 2003 comments recommended that "need" analysis should include an evaluation of the economics of the proposal and the practical limitations on operations.

7. The October 29, 2003 comments repeat earlier recommendations, such as the fact that a faulty conceptual model creates great uncertainty and unreliability and the predictable dewatering of prime wetlands requires additional conservation in setting maximum operating parameters.

8. The December 2, 2003 comments recommended that the application should be denied because the specific deficiencies noted in the Department's findings dated

August 12, 2003 had not been addressed.

Therefore, the Water Council should order that the Department should provide its written response to the recommendations of the Town of Nottingham Selectmen as presented in Attachments A, B, C, D and E.

Second ground for appeal.

It was arbitrary, unreasonable and unlawful for the Department to conclude that USA Springs' submittals were consistent with the requirements of the law and regulations.

In its decision dated August 12, 2003, the Department found that the report upon which the application relied was based upon incomplete and incorrect data and that the applicant has not accurately assessed the data. For example, the Department found that:

1. The hydrologic conceptual model presented by USA Springs was conflicting in significant respects, (i.e., stating that the bedrock was vertically insulated from surficial overburden; while stating that the bedrock is rapidly recharged by precipitation of events.) Accordingly, the Department found that the information submitted up to August 12, 2003 was not complete and correct and was not assessed accurately to the extent that it can be demonstrated that the withdrawal will not produce impacts which can and will be mitigated. (NHDES Decision August 12, 2003 at 3).

2. The Department also found that the report did not show an understanding by the applicant of the response of the bedrock aquifer and overburden aquifers to precipitation events or to the pumping of large withdrawals. Accordingly, the Department found that the report was not complete or correct and was not assessed accurately to the extent that it could demonstrate that impacts will be mitigated. (NHDES Decision August 12, 2003 at 5).

3. The Department found that the withdrawal testing data did not properly incorporate and analyze the effects of changing weather conditions. Because the period immediately prior to and during the withdrawal tests was dominated by constantly changing and contrasting weather conditions including rain, snowfall, warm weather causing significant snowmelt and periods below freezing temperatures causing surface water bodies to freeze, the Department found that the information in the report was not complete and correct and was not assessed

accurately. (NHDES Decision August 12, 2003 at 6).

4. The Department found that the application does not provide a clear basis for delineating the extent of the zone of influence relative to orientations of the site. Since the delineation of the zone of influence is required by regulations, the Department found that the information in the report was not complete and correct and was not assessed accurately. (NHDES Decision August 12, 2003 at 9).

5. The Department found that two feet of drawdown in the shallow overburden which was presented by the report may be significant. It further found that the application does not assess if two feet of drawdown would be impact the functions and values of the wetlands including the prime wetlands adjacent to the site. Accordingly, the Department found that the information in the report was not complete and correct and was not assessed accurately. (NHDES Decision August 12, 2003 at 11, 12).

These are simply some examples of the broad rejection by the Department of the data and analysis which was presented by the applicant.

Subsequent to the Department's entry of its findings, the applicant filed a motion for rehearing and then filed additional information on September 11, September 29, and November 12, 2003. The supplemental information which was filed by the applicant does not provide a technical basis for the Department to change or modify the findings it made on August 12, 2003 which totally rejected the accuracy and reliability of the applicant's report. Nevertheless, the Department appears to have decided that despite the incorrect and incomplete data and inaccurate assessment, the applicant's filing could be considered in compliance with regulatory requirements, solely on the basis of the applicant's proposal to monitor and adjust its withdrawal amounts based on arbitrary "triggers". As to prime wetland impacts, RSA 482-A requires that the applicant demonstrate no adverse impacts by "clear and convincing evidence". This action, by the Department, is an arbitrary, unreasonable and unlawful exercise of authority because the

Department has not been presented with the information required by the regulations, i.e., complete and correct data accurately analyzed. The Department's conduct disregards the fundamental purpose of RSA 485-C which is intended to protect the groundwater in the interests of public trust by establishing conservative withdrawal limits justified by data demonstrating an accurate understanding of the water source.

The Department's conduct ignores the provisions of law and its own regulations which were established to prohibit excessive groundwater withdrawals. Further, its action will allow the applicant to proceed with excessive withdrawals based solely upon the applicant's claim that it will monitor conditions and that the monitoring will reveal in timely fashion conditions such that mitigation procedures can be implemented to avoid adverse impacts.

Therefore, the Water Council should find that the USA Springs' application and data must be denied since its does not provide a technical basis for approving the withdrawal at the level proposed. The data has been found to be unreliable and does not provide a sufficient understanding of the hydrologic character of the water source such that adverse impacts can be predicted or avoided. The Department has no authority to issue a permit without this technical basis.

Third ground of appeal.

The Department was arbitrary, capricious and unlawful in finding that water quantity issues raised by the absence of complete and accurate data could be left unresolved solely by insertion of a condition of monitoring followed by mitigation.

The purpose of the law and regulations is to ensure that an applicant is permitted to withdraw from its property only a reasonable amount of water as demonstrated by complete and

correct data and accurate assessment of the water source. The regulatory program places the burden on the applicant to demonstrate through an appropriately designed and implemented pumping test that a rate of withdrawal is reasonable and can be sustained under conservative analysis of the data presented. As demonstrated in the Department's August 12, 2003 findings, the applicant failed to demonstrate that its proposed withdrawal amount (average 310,000 gallons per day and peak 475,000 gallons per day) can be sustained. For example, the Department found in its August 12, 2003 decision that:

a. the conceptual model was incomplete and incorrect,
b. the conduct of the pumping test was undertaken in inappropriate conditions,
c. the interpretation of the data was incorrect and inaccurate,
d. the report failed to properly calibrate the data given changing weather conditions,
e. the application did not properly delineate the zone of influence,
f. the report did not analyze the impact a wetland functions and values in a complete or accurate manner, and
g. the impact on private wells was not evaluated completely or accurately.

These defects were not resolved by any of the information submitted by USA Springs following the August 12, 2003 denial. Accordingly, the Department appears to have decided to ignore these defects and appears ready to accept that an application with these defects could be approved based solely on a proposed monitoring and mitigation plan. This conduct is arbitrary, unreasonable, and unlawful because it essentially ignores the fundamental principle that it is the Department's responsibility to protect the public resource by requiring complete and correct data and analysis to support the proposal. The burden of supporting the application is on the applicant. Without complete and correct data and an accurate analysis, the Department's action on an application is purely a guess. The Department's approach could establish a precedent that would allow any data regardless of its accuracy or completeness to be presented as support to an

application. The Department's action disregards virtually all of the regulatory requirements established in Env-Ws 388 and Env-Ws 389 as the basis for reviewing an application. The Department's decision does not follow the regulations but instead defers to a monitoring and mitigation plan even though there is no assurance that monitoring will promptly identify adverse impacts or that mitigation will be promptly and efficiently implemented.

Therefore, the Water Council should deny the proposed withdrawal as being unsupported by accurate and complete data. If any groundwater withdrawal is to be approved on the basis of the existing data, the withdrawal must be limited because of the unreliability of the data. Of course, if the operating experience demonstrates that the limit is too conservative, then the applicant may be allowed to request to increase the amount as provided in Env-Ws 389.21. It is contrary to the statutory program to essentially grant whatever is requested subject to cutting back when adverse conditions appear.

Fourth ground for appeal.

The Department's findings are arbitrary, unreasonable and unlawful in determining that the applicant has demonstrated a need for the proposed withdrawal and that the water will be utilized in an efficient manner.

USA Springs' application is to withdraw for private monetary gain a public resource (the groundwater) upon which the residents of the citizens of Town of Nottingham and its environment rely. While under New Hampshire law, riparian owners have the right to reasonable use of the groundwater beneath their property, it is the applicant's burden to demonstrate, in the manner required by the regulatory program, that its proposed use is both reasonable and necessary. RSA 485-C:4(xii)(b) mandates that the Department establish regulations to require

an applicant to demonstrate a "need" for the proposed withdrawal. The Department's regulations require the applicant to demonstrate need. Env-Ws 389.20 requires that approval of a permitted production volume in excess of 57,600 gallons per day must comply with the provisions of RSA 485-C:4(xii) and En-Ws 388, which require a demonstration of need.

Here, USA Springs has provided no information that its proposed withdrawal of 310,000 gallons per day is either "reasonable" or "necessary". The proposal, which includes a request for peak withdrawals of up to 475,000 per day solely from bedrock wells, is a very unusual proposal. The Department has recognized that the pumping test report showed "more total impacts and more impact over a greater distance than any other application" reviewed by the Department (NHDES Decision, December 11, 2003 at 4). Despite the unique nature of this proposal and the recognized unreliability of the data presented by the applicant to support it, the Department has failed to require any showing of "need" other than the applicant's statement that it desires to process an average of 310,000 gallons of water on a daily basis. There has been no presentation by the applicant that the amount requested is "necessary" in order to operate an economically viable business and the Department has requested no such showing. There has been no demonstration that the applicant can realistically process and sell the amount of water requested and the Department has required no such showing. There has been no presentation of industry standards for comparable facilities which might provide some benchmarks for a decision. On the other hand, the Town has imposed under its local zoning a requirement that the applicant's permission to use the site for a commercial is limited to a total of 60 trucks per day entering and leaving the site within a 24 hour period. Operations are limited to only six days a week (none on

Sunday) and only during the hours of 8:00 a.m. to 5:00 p.m. The applicant has made no showing that it can realistically or efficiently use the amount of water requested given the Town's restrictions on operating hours and trucking activity. The Department has required no such showing. Thus to the extent the Department's finding could be interpretated to mean that the applicant has demonstrated a "need" for 310,000 gallons a day such finding is arbitrary, unreasonable and unlawful because there has been no evidence of need presented by the applicant nor any analysis of need made by the Department. The amount requested is clearly excessive given the operating restrictions imposed on the applicant's proposed operation, not to mention the absence of supporting data.

Therefore, the Water Council should order that the Department should undertake a reasonable analysis to scope the applicant's "need" for water. This is a requirement of both the law RSA 485-C and its own regulations.

WHEREFORE, the Town of Nottingham Selectmen respectfully requests that the Water Council find that the Bureau's findings presented in its decision dated December 11, 2003 are arbitrary, unreasonable and contrary to the law and order that the Bureau, clarify and/or amend its denial of the USA Springs' application for a large groundwater withdrawal permit under Env-Ws 388 and a new source of bottled water permit under Env-Ws 389 as follows:

1. Make specific written findings with respect to the Town of Nottingham recommendations. (Attachments A, B, C, D and E).

2. Find that the applicant has failed to produce a report which presents complete and correct data with respect to the proposed withdrawal and fails to accurately assess that data,

including but not limited to the following areas:

a. The conceptual hydrologic model;

b. The delineation of the zone of influence;

c. The impacts on water resources;

d. The impacts on prime wetlands and wetlands (as shown by clean and convincing evidence); and

e. The impacts on private wells.

3. Find that the issuance of a groundwater withdrawal permit may not rely solely on a proposed monitoring and mitigation condition, but must be based upon complete and accurate information and assessment of that information.

4. Find that the applicant has failed to produce evidence sufficient to support a finding of "need" as required by the regulations.

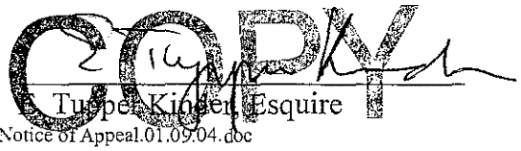
Respectfully submitted,
TOWN OF NOTTINGHAM SELECTMEN
By its attorneys,
Nelson, Kinder, Mosseau & Saturley, P.C.

Dated: January 9, 2004

E. Tupper Kinder, Esquire
99 Middle Street
Manchester, NH 03101
Tel. (603) 647-1800

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing have been mailed, first class, and postage prepaid Mark Beliveau, Esquire, Gregory Smith, Esquire, and Assistant Attorney General Richard Head.



Tuppet Kinder, Esquire

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A

Technical Comments on the July 18, 2002 Preliminary Hydrologic Characterization in Support of a Large Groundwater Withdrawal Permit Proposed USA Springs Bottling Plant – by Gradient Corporation

Tom Ballestero
12 August 2002

I.) Conceptual Hydrogeologic Model – Recharge – Radius of Influence

The application does not have a conceptual hydrologic model of the bedrock ground water system, as indicated by Env-Ws 388.04.c (2) and in accordance with Env-Ws 388.06. The Applicants' understanding of the bedrock ground water system is insufficient to move forward with the pumping test of the well field.

1. The subject report does little to address many of the issues of the former December 2001 report by Geosphere. More importantly, few of the important NH DES comments (Feb. 20, 2002) were addressed. For example, NH DES comment 1.c.vii – estimation of recharge areas. This report, as did past representations by the Applicant, also compares estimated overburden recharge to bedrock pumping volumes. This is inappropriate and misleading because no data was developed to support this comparison. There is no substantive evidence to assert or conclude that the bedrock at the site is entirely recharged by precipitation and at the rate at which overburden is recharged. This reveals that the Applicant possesses a very poor understanding of the hydrologic system. NH DES comment number 2 reinforces the request to understand bedrock recharge mechanisms. This point is ignored in the Gradient Report. Understanding the source and ultimate fate of bedrock ground water is necessary in order for the Town or State to accept a properly designed pumping test and then determine the ultimate effects of the proposed pumping. The Applicant's rationale for the approach has consistently been that the pumping test will reveal all that needs to be known. The reality is that an effective pumping test cannot be designed without basic information about bedrock hydrology. For example, ground water samples from the existing wells should be analyzed for a more complete suite of water quality parameters, including those capable as acting as hydrogeochronometers. The Applicant's present design of the pumping test will not generate the information necessary to answer the questions of bedrock ground water source and fate. There is little information in the description of the pumping test about how the data that is gathered will answer these questions...especially in light of the fact that the relatively very brief pumping test (7 to 10 days) must generate data for estimation of consequences to occur over decades of pumping.

2. Little information is offered on how wetlands will be tested, "How do we know that there is no adverse impact?" How is the collected data used to make this inference? This is NH DES comment 5. At the public meeting on July 24, 2002, the Applicants consultant stated that water levels will be taken. But what do these levels mean? How is the data interpreted? At what point does any change in the water levels signify an adverse impact? Limits to the amount of impact (water level change) should be offered, even for the pumping test. How will the data from the pumping test be extended to decades of pumping? Few, if any details are offered on these questions. These are fundamental questions that have been raised now for over one year.

3. Although wells OW1 and OW2 are offered to be installed, additional bedrock monitoring wells have been suggested in the past: particularly on the southeast side of the parcel, near to the property boundary with the Lincoln Drive subdivision, and another well to the west by Route 4. Also, the NH DES comment on the appropriateness of the location of OW1 as an "ambient well" was not addressed (comment 16). There is a lack of water level information in the principal direction of rock fractures (northeast – southwest strike). This data is imperative for the Town to insure that undeveloped properties in the northeast to southwest directions will have a source of water for their future uses. All proposed wells need to be located on a site map.

4. The ability of the soil overburden to hydraulically interact with the bedrock below has been presented with conflicting descriptions by the applicant. In the Gradient report, they site the 1990 USGS report that indicates that the till has low permeability. This is supported by the drilling logs that indicate dense till at all well locations. However the Gradient report then states that, "The presence of very large, loose, stratified, sand and gravel material noted in the on-Site till deposits indicates that these overburden materials are likely to demonstrate moderate to high transmissivity at least in certain portions of the Site and vicinity." These locations are not delineated in the report or on a figure, so they cannot be independently verified. This conflict about the hydraulic conductance of the overburden materials creates significant issues related to: effects on wetlands, source area of bedrock ground water, and short-circuiting of water at the pumping test discharge zone, to name a few. These issues will be delineated here in subsequent paragraphs, however it all boils down to the fact that more effort needs to be performed to identify the hydraulic characteristics of the till, prior to any pumping test, and more wells need to be installed. More wells are especially warranted if the till characteristics are non-homogeneous or is the primary source of recharge to the bedrock.

Effects on Wetlands: If the hydraulic conductivity of the till is high, then there is a strong connection between rainfall recharge and bedrock ground water. At the same time though, there is a strong connection between bedrock ground water and wetlands. To define this connection, additional multilevel couplet wells are necessary at all wetland areas and also near to each of the pumping wells.

Source Area of Bedrock Ground water: If the hydraulic conductivity of the till is low, little recharge from precipitation can reach the bedrock ground water. Therefore the source of bedrock ground water is regional flow and/or distant outcrop/recharge. This then increases the size of the radius of influence of the bedrock ground water pumping.

Short-circuiting of Discharge Water: If the hydraulic conductivity of the till is high, then discharge water can easily find its way back to the bedrock, and possibly be recycled during the pumping test. This results in a grave underestimation of the radius of influence. To verify that recycling of pumped water does not occur, additional multilevel couplet wells are necessary at the discharge location and along the route of the discharge water in surface streams.

5. Section 3.2.4, supported by Table 2, again uses misleading calculations to imply that the proposed withdrawal of bedrock ground water is insignificant. In this case, a high value of recharge to the till of the entire 14.4 square mile study area is compared to the proposed withdrawal of 300 gpm from bedrock ground water. This comparison is completely inappropriate since the hydraulic connection between the till overburden and the bedrock is

unknown. Additionally, the recharge in the study area does not all go to the bedrock at the site: much of this water feeds wetlands, streams, and ponds. The comparison might as well be between the bedrock pumping and the volume of water in the ocean: there is no documented connection between the bedrock recharge and that for the overburden in the entire study area. The value of recharge to the overburden that was used was 25% of precipitation, assumed to be 40 inches per year. The 1990 USGS publication (cited in the Gradient Report) quite clearly states that recharge in till-covered uplands is approximately seven inches per year. The USGS study was specific to the watersheds at and proximal to the site, the value for recharge used by Gradient was not.

6. Section 3.2.5 of the Gradient report starts off by apologizing for the limited number of wells used to develop the bedrock head and flow map. However there are a vast number of wells in the area. The NH rules for large ground water withdrawals are the minimum guidelines. In this instance, with so much unknown about the recharge mechanism and the source areas, a much more involved effort is warranted to develop a bedrock piezometric map from existing wells. This must be done before the pumping test in order that there is confidence that the planned pumping test generates information capable of identifying the radius of influence and adverse impacts.

7. The phrase "adverse effects" appears numerous times in the Gradient Report, as it has in previous consultant reports. The phrase by itself is inadequate because it is vague and undefined. If there are potential undesirable or untenable consequences, during the pumping test or in the long term pumping, these need to be defined, and agreed upon, in quantitative measures before any pumping begins. By doing so, there is no question if and when the effects occur.

8. Section 5.5 of the Gradient Report tersely states that the pumping test data, "...will be analyzed using appropriate aquifer testing analytical solutions..." The methods proposed in this section are those for homogeneous, isotropic formations, and not fractured bedrock. While the methods are useful estimators, they are poor at accurately predicting effects in fractured rock systems. The Applicant must identify appropriate methods for analyzing the data from the bedrock system in the study area. Furthermore, the use of the Jacob-Cooper method may be inappropriate at locations at distance from the pumping wells. No measures of model validity are proposed for these methods. The section goes on to state that, "...the data collected during the pumping test and identified fracture traces will be used to account for preferential response..." As number 3 of these comments indicates, there is currently a paucity of data in the primary fracture direction. Couple this with the fact that the fracture traces referenced in the Gradient report are nothing more than lines drawn on a map from aerial photographs and therefore may or may not be real, leaves the estimate of the delineation of the zone of influence extremely suspect.

9. The Applicant has not completed the requirements of Env-Ws 388.06 (particularly subsections i, j, l and m) in that the conceptual model of ground water source is not understood as well as the effects of pumping. There is no basis for what the Applicant has provided as a conceptual model and this model defies the realities of New Hampshire bedrock ground water hydrology.

10. Env-Ws 388.08 requires that the effects of pumping be estimated. This is not done. Potential effects are identified, but no estimations are made. This is a glaring deficiency of the report.

11. Env-Ws 388.18 c is quite clear that large ground water withdrawals may not reduce drinking water supplies or the ability of surface water to dilute pollution sources. The proposed withdrawal will result in both of these concerns being violated in the Lamprey River system. The Applicant has not addressed them.

12. Env-Ws 388.04g states that, "...the permit application shall be ...Not misleading." The comparison of overburden recharge to bedrock ground water pumping is misleading and not sound hydrology for this region.

II.) Amount of Withdrawal Requested

The existing step test data for the wells at the site indicate that when all wells are pumping the requested flow of 300 gpm, the flow is unsustainable. The Applicant should come forward with a more realistic pumping request that is based on the analysis of data to date. The pumping rate affects the design of the pumping test.

13. The step test data was not revisited by the new consultants. This data clearly shows that neither the desired maximum day rate of 300 gpm nor the average daily rate of 244 gpm can be sustained. This is primarily because none of the requested flows for wells USA-1, USA-2, and USA-4 had stabilized during the step tests. Lack of credibility in this one item leaves the entirety of the report and planned pumping test as suspect. During the initial, and only, step tests, wells were tested individually. None of the step test data achieved a stable pumping water level: the water levels continued to plummet in each case. This will only be exacerbated when all wells are pumped at the same time and for longer than the 3 to 120 minute steps used in the step tests. In fact, the Applicant's expected largest producing well (USA-2) exhibits a step test response that is quite alarming: at the 175 gpm rate, drawdown increased precipitously after 30 minutes. No explanation of this data has been offered in the Gradient Report. Clearly, the system of three wells is incapable of delivering the requested flow. The existing data needs to be synthesized, and a more realistic demand requested. Then, an appropriate pumping test can be planned.

14. The conservation management plan is tied to the amount of ground water pumping. If the estimated ground water pumping is in error, then there are flaws in the conservation management plan.

III.) Wetlands

The ambient monitoring and the monitoring during the pumping test are ineffective to be able to clearly delineate the relationship between wetlands and ground water.

15. Section 3.1 of the Gradient Report lists no site-specific wetlands studies to date. Given the importance ascribed to wetlands by the communities, this is a glaring omission, and underscores the Applicants lack of appreciation of the wetland ecosystems.

16. More details on wetlands monitoring, and especially the presentation and interpretation of the data, is necessary. The phrase at the end of section 5.3.2, "...as many times as possible..." is insufficient and inappropriate. If the exact number of times that wetlands data collection is to occur cannot be stated, a minimum number should be identified. The way this is worded now, no monitoring may take place because it was not possible.

17. At this writing, the Applicant has not demonstrated the flow of water between wetlands and ground water.

18. Env-Ws 388,23c indicates that the withdrawal permit in this case will not be issued by NH DES if it can be demonstrated that the withdrawal will result in adverse impacts that cannot or will not be mitigated. The Applicant suggests that this is the case...by implying that the water from the wells will come from overburden, and that the pumping effects are constrained to close to the wells: this then defines a situation in which wetlands will be dewatered by the pumping.

19. Long-term wetland monitoring should include species density and diversity in either established plots or transects.

20. Due to the dynamic nature of wetlands, a minimum monitoring period of more than three years is necessary in order to understand the existing system. In planned quarries in both Londonderry and Litchfield, wetlands affected by bedrock ground water pumping were to be monitored for five years prior to any site development. This was satisfactory to both the applicant and the towns.

IV.) Planned Pumping Test

At this time there are too many hydrologic unknowns to approve of the pumping test.

21. The pumping test discharge is estimated to be 30% of the Route 4 culvert discharge, and that the average annual storm is all that the culvert can handle. What happens in the event of a storm? At what point should the pumping be stopped?

22. Well completion specifications and well construction methods need to be specified for all proposed wells.

23. The issue of identifying well water quality prior to the pumping test is an important public health concern. Although no contamination is expected, there are natural contaminants (Radon and Arsenic, for example) that warrant testing for the full suite of Safe Drinking Water Act constituents for public water supplies. This testing must be done prior to the discharge of this water onto the land. Since the pumping test discharge water is to cross private lands and flow into public water supplies, this is not considered as an unreasonable condition.

24. At this writing, no estimates have been made of the potential radius of influence for the pumping test or the long term pumping of 300 gpm. Typical values of transmissivity (100 ft^2/day) and storage coefficient (0.01) for seacoast New Hampshire bedrock formations put the radius of influence (where drawdown is less than 0.1 ft.) for the pumping test on the order of 1,000 feet, and for long term pumping 5,000 to 9,000 feet. These calculations took less than five minutes to complete. The point being that the Applicant has consistently indicated that many technical items must await the pumping test, when in reality there are many questions left unanswered that could be addressed. A partial list of items that should be addressed prior to the pumping test include:

Understanding the nature of bedrock recharge,

Age dating the bedrock ground water,

Identifying the background water quality of constituents of concern (Arsenic, Radon, Mercury, etc.),

Delineating if wetlands are ground water discharge or recharge zones,

Bedrock piezometric map based on more than just the Applicants wells,

Analysis of the step test data for estimates of transmissivity and storage coefficient,

Analysis of the fracture field data (Appendix C in the Gradient Report), to understand if the bedrock hydraulically is best represented by a fracture model or a porous media model, and

Statistically significant relationships between environmental stresses and water levels.

25. The pre-withdrawal test is a good idea, however there are too few details given to approve of it. How are the results to be used? What are the guiding parameters (technical, theoretical, control, and operational) for the test? It is implied that the pumping test can begin as soon as water levels recover from the pre-withdrawal test. Given the magnitude and weight of the pre-withdrawal test results, there should be much more time allotted to their synthesis. In short, this is the type of information that should have been supplied to gain permission for the pumping test in the first place.

26. Many of the surface water bodies potentially affected by pumping are to be monitored by staff gages. Presumably the objective of these monitoring devices is to identify a hydraulic connection between the pumping and the surface water body. As indicated in the past, these gages provide little information useful to interpretation of cause and effect, that is, the surface water bodies being tapped for water by the pumping. More appropriate devices are miniature piezometers or wells that specifically target the hyporheic zone and can measure the gradient of water fluxes between ground and surface waters.

27. During the pumping test, the Applicant should have an inspection schedule for the culverts along the path of the discharge water, and the onsite capability for their maintenance to insure that the culverts flow freely.

28. The section on Impact Response (5.4.1) identifies general concerns but few specifics are offered. The 21 private wells to be monitored during the pumping test will first have some physical data collected, and then some method will be employed to determine wells with "... a relatively high likelihood of impacts..." How is this performed? What are the quantitative measures? Target (threshold) drawdowns are proposed for these wells during the pumping test...meaning that if the targets are reached, pumping will be reduced. How are the threshold levels set? How are these targets defined? What data is used to make this definition? The rate at which drawdown in these wells occurs, prior to achieving the target, should also be a control variable. For example, if a target is set in one well at 100 feet, and the first hour yields 60 feet in this well and by the third hour it is at 90 feet, it can be predicted that the target will be attained and therefore the cutbacks should be made at the time of the prediction, rather than delaying the reduction of pumping until the target is actually achieved.

29. Section 5.5 of the Gradient Report tersely states that the pumping test data, "...will be analyzed using appropriate aquifer testing analytical solutions..." The methods proposed in this section are those for homogeneous, isotropic formations, and not fractured bedrock. While the methods are useful estimators, they are poor at accurately predicting effects in fractured rock systems. The Applicant must identify appropriate methods for analyzing the data from the bedrock system in the study area. Furthermore, the use of the Jacob-Cooper method may be inappropriate at locations at distance from the pumping wells. No measures of model validity are proposed for these methods. The section goes on to state that, "...the data collected during the pumping test and identified fracture traces will be used to account for preferential response..." As number 3 of these comments indicates, there is currently a paucity of data in the primary fracture direction. Couple this with the fact that the fracture traces referenced in the Gradient report are nothing more than lines drawn on a map from aerial photographs and therefore may or may not be real, leaves the estimate of the delineation of the zone of influence extremely suspect.

30. Section 5.2 of the Gradient Report states that, "The outlet from the culvert will be protected from erosion by installing some rip rap and hay bales to reduce the flow velocity." If erosion is anticipated to be an issue, it should be supported by hydraulic calculations. If the potential is there, the method of preventing the erosion should be addressed by more thoughtful consideration of all solution strategies. There is no supporting documentation that indicates that the rip rap or the hay bales are the appropriate methods for erosion control at this site. Lastly, there needs to be design drawings for the erosion control designs.

31. Section 5.3.1, page 22 of the Gradient Report, manual ground water measurements are to be taken once per week to verify pressure transducer measurements. This frequency should be increased to twice per week in order that too much data is not lost, due to malfunctioning pressure transducers, during the pumping test. Manual measurements should be taken in all wells just prior to pumping and just prior to shutting off the pumps.

V.) Understanding the Effects of Ambient Stresses on Bedrock Hydrogeology

The proposed ambient monitoring prior to the pumping test is too short for a bedrock formation. Statistically significant relationships between ambient stresses and ground water levels must be developed prior to the pumping test.

32. The antecedent monitoring period, described in Section 5.3.1 of the Gradient Report, gives insufficient details on the use of the data, especially if the data is at all capable of delineating the trends and baseline conditions. For example, one month of data collection may be insufficient to get a statistically significant relation between atmospheric pressure and water level change. In this event, the pumping test data cannot be adjusted for environmental stresses. Since the pumping test is planned to be performed before the quality of the antecedent data is understood, this renders the pumping test data to little value until the relation of ambient stresses to water level is confidently determined. Also, there is no detail on the procedures to be followed in the event of equipment malfunction (for example the pressure transducers) and subsequent loss of the data. What is the minimum amount of data necessary?

33. One week or even one month of sparse background data collection will not yield sufficient information to clearly delineate effects of pumping from ambient stresses. This also reflects NH DES comment 23. For example it is very possible that zero or only one rainfall event occurs during this ambient monitoring period. Or only three or four significant pressure fronts move through the area during the same time period. This is insufficient data to determine how the bedrock system responds to ambient stresses. If a significant stress then does occur during the pumping test, the Applicant will be incapable of accurately incorporating the information to modify the observed water levels in order to isolate only the responses due to pumping. This is acutely important to the delineation of the radius of influence for the long term pumping of bedrock ground water.

34. It is stated that precipitation will be measured however there is no explanation how precipitation data will be used.

35. Section 5.3.3 of the Gradient Report indicates what analytes will be measured in well OW-2. pH, conductivity should be measured in the field and again at the lab.

VI. Other Issues

31. If the Applicant intends to store wastewater onsite and truck it to a POTW, there needs to be a letter of Commitment from the POTW included in the application package. Also, the plant is estimated to generate 7,150 gallons per day of wastewater. Only a 20,000 gallon tank for onsite wastewater holding is planned. At a minimum, and additional 20,000 gallon tank needs to be included as a standby. What are the details for secondary containment?

36. In section 4.1 of the Gradient Report, the comment is made that, "There are no permitted surface water withdrawals ...identified within the study area." To the letter, this is true, but in the hydrological framework, this is not. Mendums Pond serves as a low flow control measure for downstream water supplies, and Mendums Pond is in the study area. The bedrock

piezometric map offered by the Applicant implies bedrock ground water discharge to surface water bodies of the Lamprey River system. Since the entire study area is in the Lamprey River watershed, until the Applicant shows otherwise, it is presumed that all bedrock ground water discharge from the study area yields surface water to the Lamprey River. Therefore the consequences of the loss of 432,000 gallons per day from the watershed must be considered: specifically effects on the downstream water supplies as well as its potential for water quality impairments.

37. Section 3.2.4 of the Gradient Report, and numerous times during the July 23, 2002 public session, the comment was made that an impact analysis in the absence of recharge for 180 days is a "worst case scenario". This is not a worst case scenario. From June through October in most normal years, precipitation can be less than evapotranspiration...this alone is five months without recharge. Given that bedrock in New Hampshire has a much lower hydraulic conductivity than the overburden soils, this further minimizes recharge. So it does not take an excessively dry year to achieve 180 days without recharge to the bedrock system. This is a realistic scenario, and one prescribed for planning purposes.

38. Env-Ws 388.27 states that applicants and permit holders must comply with all other state, federal, and local government regulations and requirements. Env-Ws 388 regulates the withdrawal of the water from the ground. Env-Ws 388.01 does not say anything about the discharge of pumped water or the ground water rights of undeveloped riparian lands.

B

NELSON
KINDER
MOSSEAU &
SATURLEY, PC
ATTORNEYS AT LAW

FILE COPY

March 14, 2003

HAND DELIVERED

Anthony P. Guinta, PG Administrator
Water, Supply Engineering Bureau
6 Hazen Drive
Concord, NH 03301

Re: USA Springs Large Groundwater Withdrawal Permit Report

Dear Mr. Guinta:

This office represents the Board of Selectmen of the Town of Nottingham. Attached to this letter is the report of Professor Thomas Ballestero who has reviewed the USA Springs' Report for the Nottingham Selectmen. The Town Selectmen wish NHDES to consider Professor Ballestero's conclusions and recommendations in their review of the USA Springs Large Groundwater Withdrawal Application.

Because of the issues identified by Professor Ballestero, the Nottingham Board of Selectmen reiterate their request that NHDES hold a forum for public comment on the USA Springs' Report. Of particular concern are the following:

1. The application and report is deficient in that USA Springs does not demonstrate a need for use of the water resource at the requested rate as required by ENV-WS 388.05. The requested rate is apparently based upon the maximum rate at which the wells can be pumped allegedly without having an adverse effect. The applicant has made no showing that this rate is "needed" in order to make the project successful or viable. In fact, as you know, the requested maximum rate of 475,000 gallons per day and an average of 309,000 gallons per day exceeds the practical limitations imposed on the project by the special exception granted by the Nottingham Zoning Board of Adjustment. The special exception limited USA Springs to a transportation rate of a maximum of 60 trucks entering the site per day operating only between 9:00 a.m. to 5:00

p.m., and only six days a week. The Selectmen have consulted with a transportation expert who has provided an opinion that the maximum daily transportation output of the project is approximately 242,550 gallons per day. (See attached Duval Affidavit). The project's weekly output will average significantly less given that no transportation is permitted on Sunday. While the applicant disputes this, it should be required to present data supporting a practical need. Of course, the applicant's "needs" must also be balanced against the currently existing needs of wetlands, the environment, users of the source area water as well future potential uses.

2. The identification of contamination on the USA Springs site and abutting properties within the source water protection area raises a number of issues. No permit should be granted until additional information is generated concerning the nature and extent of the contamination and how its migration pathways may be affected by the pumping of the source wells and whatever remediation strategy is selected.

3. The pumping test data demonstrate that the requested average daily withdrawal rate of 309,000 gallons per day is excessive.

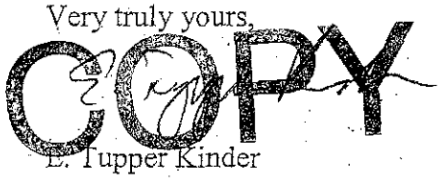
4. The pumping test data suggest that the adjacent prime wetland will be affected by long term pumping at the site. Accordingly, NHDES may not grant a permit without conducting a hearing under NH RSA 482-A:11(IV), 482-A:15 and making the required findings, by clear and convincing evidence after public hearing, that there will be no significant net loss of any of the values set forth in NH RSA 482-A:1.

5. The pumping test report indicates that the applicant has installed an additional well on its property (the Barn well) with an alleged capacity of 36,000 gallons per day. The report also suggests that the applicant intends to install additional extraction wells for the purpose of creating a hydraulic barrier to prevent the contamination from reaching the source wells. The operation of these wells has not been considered in the pumping test analysis. The application should be revised to reflect the proposed operating characteristics of these wells so that the use of these wells are also controlled by the conditions of the permit.

On behalf of the Nottingham Selectmen, I look forward to an opportunity to discuss the attached comments with representatives of NHDES during their review of the USA Springs application.

Please feel free to contact me if you have any questions.

Very truly yours,



E. Tupper Kinder

ETK/sma
Encls.
cc: Town of Nottingham Selectmen
Gregory H. Smith, Esquire
Mark Beliveau, Esquire
John Teague, Esquire
Thomas Ballestero, Ph.D.
Brandon Kernen
Harry Stewart
G:\Cases\Noting\Letters\Guinta.002.doc

Comments on the February 3, 2003 USA Springs Pumping Test Report and Appendices
Thomas P. Ballestero
14 March 2003

Summary Conclusions and Recommendations

1. No pumping should be permitted until more is known of onsite and offsite contamination.

There is now known contamination, in the overburden and bedrock, which violates regulatory levels. The drawdown for the brief 10 days of pumping caused tens of feet of drawdown under this area of contamination. No studies to date have delineated the source, extent, and pathways of the contaminants. Given these facts, any request for groundwater pumping must be denied until: a.) more is known about the contamination, b.) a remediation strategy has been designed and implemented, and c.) it can be demonstrated that the groundwater pumping for a bottling plant (or any other commercial/industrial use for that matter) does not interfere with the remediation strategy or effect plume movement.

2. There is insufficient ambient flow at this site to support the request to pump 309,600 gpd

The report detailing the pumping test provides estimates of groundwater velocities, hydraulic conductivities, gradients, and flow nets for both overburden and bedrock formations. These data can be synthesized to interpret that the flow moving under the site in the overburden is about 5,000 gallons per day (gpd) and in the bedrock 194,000 gpd. The source of this water is infiltration onsite and regional groundwater flow from upgradient locations. These ambient flows are substantially less than the requested pumping rate. It also underscores why such dramatic drawdowns were observed during the pumping test (indicative of dewatering) and why the pumping wells did not reach equilibrium pumping levels. This demonstrates that the requested amount is unsustainable. This same report estimated the flow from the overburden to a small area of the Barrington Prime wetland to be 1,600 gpd. When considering all wetland area within the same perimeter of the pumping wells as the Barrington Prime wetlands, these wetlands need to be supported by both overburden and bedrock flows: there is insufficient flow in the overburden alone. The reality is that the requested pumping rate of 309,600 gpd far exceeds the amount of water that flows under the site. A sustainable pumping rate is one that is less than the total ambient groundwater flowrate minus the needs of individual downgradient homeowners and wetlands. The projected sustainable rate should also consider future upgradient uses. Such a rate, based on the data presented here, should only be a portion of the 200,000 gpd currently flowing under the site. What should be underscored here is that these estimates of ambient groundwater flow were used by employing the data available in the report. The requested volume of 309,600 gpd is very large compared to ambient flow; in fact the request exceeds ambient flow without considering any other uses. This highlights that the estimates of bedrock recharge by precipitation, presented in the report, are also overestimated.

3. The bedrock groundwater recharge mechanism is poorly understood

The report concludes that since the precipitation that occurred during non-pumping times was succeeded by significant increases in bedrock water levels, that precipitation quickly recharged bedrock. This is one possible interpretation of water level data. However this is contradicted by measurements of overburden hydraulic conductivity (page 39) and the vertical

distance recharge would have to move to get to the bedrock (drilling logs). It would take weeks to months for precipitation, which infiltrated the till, to move vertically downward to the bedrock. In addition, the storage coefficient for the bedrock (interpreted from the pumping test data) indicates a confined formation, meaning that it is surrounded (above and below) by relatively impermeable materials. Another explanation of the rapid change in bedrock water levels soon after precipitation is the load (weight) that infiltration into the overburden places on the bedrock, which is then transmitted to the water in the fractures. A more accurate method of determining how much and how fast precipitation reaches the bedrock is to use chemical fingerprints, especially those that can assist in aging the bedrock groundwater. In my experience in the seacoast of New Hampshire, bedrock groundwater is very old, and on the order of thousands of years old (groundwater dating with environmental isotopes).

4. Any strategy to control the movement of contaminants requires a detailed plan and must be demonstrated prior to its implementation

The proposal to employ a hydraulic strategy to avoid drawing overburden contaminants into the USA wells describes a system where basically a wall (hydraulic barrier) is constructed that will prevent the drawdown from the USA wells from reaching beyond it towards the contamination. Water is pumped from one side of the wall to the other, and treated before being re-injected. Conceptually this may work, but the concept needs much more detail and study before it can be implemented and before any permit is issued. There is a real possibility that the installed barrier wells do not hydraulically perform as expected: neither capturing all contaminated groundwater nor capable of recharging at a rate to overcome the drawdown from the USA wells. In this light, a maximum allowable pumping rate at this time is one in which the USA wells pump at a rate that do not create significant drawdown below the location of the suspected contamination source and plume. Using the homeowner wells LeClair, Gillespie, Pierce, and Page (all wells further from the USA wells and in line with the contamination, and all wells with observed and/or predicted drawdowns in the tens of feet) as examples, the monitoring data from these wells can be analyzed to develop bedrock hydraulic characteristics: transmissivity (T) and storage coefficient (S). These values should then be used to identify the pumping rate from the three USA wells that will not result in more than one foot of drawdown in the bedrock below the contamination after 180 days of continuous pumping. An appropriate pumping rate for the USA wells is one that does not create measurable drawdown below the zone of suspected contamination. This then prevents the pumping wells from changing the current movement (path and velocity) of contaminants. Given seasonal groundwater level fluctuations and measurement accuracy for water levels, any pumping rate of bedrock groundwater should be limited to bedrock drawdown below the contamination of less than one foot.

5. The zone of predicted drawdown is much larger than estimated.

Figure 3-13 delineates an estimated zone of bedrock drawdown. Where the zone is drawn by dashed lines are areas where there did not exist well data further from the dashed line. Soon after the very northern end of the Nottingham USA property (north of USA-1), no drawdown is estimated, yet USA-1 is estimated to have 447 feet of drawdown. Considering the fracture fabric rose diagram on the same figure and the fact that groundwater drawdown progresses logarithmically, the location of no drawdown is much further north and west of the drawn dashed line. A similar logic can be applied to the west along Old Turnpike Road. Lastly,

the solid line to the WSW of the pumping wells should be mapped much further WSW than in the figure.

6. Pumping 309,600 gpd will significantly dewater wetlands

The report gives the interpretation of monitoring well data to be that few overburden wells displayed effects due to the pumping test and that only a small portion of the Barrington prime wetland will have significant drawdown below it. Although a brief pre-test monitoring program occurred, the report did not develop relations between climatic variables and water level responses. Therefore none of the monitoring well data was corrected for the precipitation that occurred prior to and during the pumping test. This then led to the misinterpretation that shallow wells were not affected by then pumping test. In reality, most of the overburden wells exhibited drawdown effects during the pumping test. In addition, wetlands to the NNW to NW of the property were not monitored and therefore no conclusions can be made about dewatering of these wetlands. However, significant bedrock drawdown, on the order of tens of feet, did occur in this direction, and therefore there is strong evidence that wetlands in this direction will be tapped for water should the request of pumping 309,600 gpd be granted. Because of the weight of evidence pointing to the fact that the overburden and wetlands will serve as a primary source of water to these bedrock production wells, as well as the law on protecting prime wetlands, an appropriate bedrock pumping rate is one that does not create a reversal in the vertical groundwater flow direction at the wetlands. This means that deep overburden drawdown needs to be maintained at less than 0.5 ft at the wetlands.

7. Pumping 309,600 gpd creates excessive drawdown in private wells

Substantial drawdown was monitored in private wells along Old Turnpike Road. The measured drawdowns in these wells were not corrected for the precipitation that occurred during the pumping test and therefore the predictions of the long-term consequences, presented in the report, are lower than what will actually occur. However some homeowners will see tens of feet of drawdown in their wells. This significantly reduces the amount of water in well-bore storage available to these residents. In addition, it will require these residents to pay more for their water since the added drawdown requires more energy to pump the well water. This can also lead to more stress on the pump and higher maintenance/replacement rates. When put together, this is a reduction in the quality of life for these residents, which is an adverse impact. The report does not address this issue other than to monitor the situation, and at sometime address problems when they arise. There is ample data to see that these adverse effects will happen at 309,600 gpd. The applicant has not demonstrated the yield capabilities of affected wells and therefore cannot technically comment on adverse impacts to homeowner wells as defined in the large groundwater withdrawal regulations. The applicant relies on homeowner complaints for determination of adverse impacts. If the applicant is unwilling to address adverse impacts at this time, then the monitoring plan requires an attendant action plan.

8. The monitoring plan is inadequate to address the issues and complexity of this site

The proposed monitoring plan has two components: water levels and wetlands. It does not have a water quality component and due to the contamination requires such a component. There are too few wells included in the plan for water levels: more of the existing wells need to be included, new wells need to be installed in the WSW and ENE directions, and more overburden wells should be included, for many of the reasons listed previously.

9. As the application now stands, predictable consequences and high uncertainty require either denial of the request or limitations to the amount of pumping.

Bedrock groundwater flow, dewatering of wetlands, significant lowering of water levels in homeowner wells, and existing groundwater contamination all provide for significant uncertainty. Adding to this reality are the effects of withdrawing 309,600 gpd. The data demonstrate that there is insufficient ambient groundwater flow beneath the property to support the requested amount.

Specific Notes and Comments

Absolutely nothing was said of the contamination on the west side of the property in the executive summary. This is a major omission.

Minimal effects are weighed in the eyes of the applicant and not from the vantage point of abutters. By lowering water levels in abutter wells (abutters who are not affecting water levels on the applicants property), the abutters must now pay more to pump water, their pumps will work harder all the time (therefore require more frequent maintenance and/or replacement), and the abutters have less water storage in their systems available to carry them through high demand periods. These are each significant consequences to abutters and need to be weighed on a well by well basis.

Without seeing the USA Springs wells placed on a wetlands map, Env WS 389.05 requires wells to be at least 50 feet from surface waters. Marshes are included in surface waters and wetlands include marshes. This needs to be determined.

Known bedrock and overburden contamination occurs 700 feet from USA-4 and quite likely closer. It should be clearly demonstrated that contamination below AGQS exists in the sanitary protective radius of USA-4 (based on the total flow from all wells).

The barn well is introduced on page 5. The supply of this well is to meet sanitary and process requirements. By this statement, the well becomes part of the overall application. This well must be included in the proposal request, its desired flowrate identified, and a pumping test performed on all wells. Otherwise the well should not be pumped at all. This is particularly imperative due to the proximity of the barn well to the Lincoln Drive homeowners.

Page 5 – 120,000 gallons of on site storage. Wells will be cycled on/off at rates of USA-1 (50 to 125 gpm), USA-2 (50 to 175 gpm), and USA-4 (5 to 30 gpm). There is no delineation of how such dramatic pumping schedules will affect private wells. This needs to be presented prior to the issuance of a permit.

The barn well pumping estimate is 2,000 gpd for sanitary and 425 gpd for process. No mention of other uses, for example irrigation, etc., is made yet is likely.

Onsite septic for sanitary wastewater and process water will be trucked to a WWTP. 20,000 gallons of storage for process wastewater (47 days at 425 gpd) is planned. This is contrary to past estimates of duration of wastewater storage.

The new barn well is said to be able to supply 36,000 gpd. If this well is included in the application, the applicant does not control the 400 ft radius for this well.

The zone of influence (Figure 3-13) is suspect in the NNE to ENE direction as there were no observation wells in this direction. The fracture fabric analysis implies that hydraulic effects should occur in this direction.

Section 3.1.3, 'Potential Contamination Sources', completely ignores the data from OW wells. While the report may be relying on the state database, the contamination is known and should be reported in this section.

Attachment B of Appendix D needs to have the proposed wells and the Applicants site boundaries placed clearly on all figures.

There is conflicting information in Attachment C of Appendix D..."The project site encompasses 78.19 acres...". Whereas section 1.1 states that the site setting is 98 acres. The 20 acres in Barrington must be included in all references to this site.

Figure 1 in Appendix D displays absolutely no wetlands on the applicants Nottingham property. This seems to be contrary to fact, since Appendix C describes the onsite wetlands. All onsite wetlands need to appear on a site map and this figure needs to appear in the report.

Adverse impacts, as delineated by Env WS 388.18 – multi-dwelling units, non-residential community systems, were not addressed. Net loss of wetland values equally was not addressed. A reduction in river flows below acceptable values (RSA 483) need to be addressed. The regulations also address, "The contamination of groundwater obtained from wells or surface waters from contaminated groundwater whose flow has been altered by the withdrawal."

Page 17 states,"...6 residential wells not surveyed for elevation and identified on Figure 3-12". The six wells are not identified in the figure.

The Sept. 11, 2002 NH DES letter challenged water budget calculations. Bedrock water budget is still largely unknown. The report assumes that 75% of the water that infiltrates the till will recharge the bedrock. This is not supported by any data. In addition, the infiltration into the till itself was not measured but estimated from other published information.

Section 3.2.3, Figure 3-1 is misrepresented as displaying outcrops. Figure 3-2 is misrepresented as a rose diagram when it is actually showing recorded precipitation for the site in the fall of 2002.

Why were OW-1D, OW-3, OW-4, and OW-5 put in after the pumping test? (Dec. 16-17, 2002)

No PID measurements were taken or reported for OW-1, yet this was reported for the other OW wells. Note that OW 1-D had a PID hit at 22 ft.

"Copper, Zinc, and Silver were recorded at concentrations slightly higher than the State of NH Surface Water Discharge criteria", Page 13. This statement needs to be expanded and discussed.

Surface water impacts are largely ignored.

On page 17 it is stated that the amount of rain during the test was small (0.55 in) and resulted in no appreciable effect on the data. If 11% of precipitation recharges the overburden at 25% porosity (Table 3-9) this amount of rainfall creates 0.18 feet of overburden ground water level change (rise). This completely discounts however that 2.81 inches of precipitation fell the week just prior to the pumping test, and that given the time of year (low evapotranspiration), most precipitation infiltrates or runs off. Many overburden wells exhibited water level increases of 0.1 to 4 feet before and during the test. It does not appear that this was factored into the water level measurements for subsequent interpretation. To extend this to bedrock, 75% of recharged water was assumed to go to the bedrock at 5% porosity (Table 3-9), therefore the 0.55 in. of precipitation could yield 0.7 ft of water level increases in bedrock wells. Residential bedrock wells, apparently not affected by the pumping, exhibited two to five feet of increase over the duration of the test. In the report, data analysis does not seem to have used any method of extracting rainfall and barometric pressure signals from the data to clearly identify only the effects of pumping.

Page 18, more detail on "appropriate field collection methods" is warranted. What are holding times? What preservatives were used?

Page 25 and figure 3-4 it appears that at topographic highs there are downward vertical gradients in bedrock, and at topographic lows, upwards gradients. This data is only valid for the snapshot in time presented by the data. The bedrock groundwater is expected to be very seasonal in nature, and therefore during drier times, for example, the areas of upwards groundwater flow are larger.

Page 25, generally groundwater flow is towards the Southeast, yet also radially from the property (to the east and west). The surface water discharge locations of the groundwaters from the site are presumably Mendums Pond and Little River.

Page 25, The hydrologic budget that is presented in the report (and based on various assumptions), is not supported by field measurements of water levels and hydraulic conductivity. There is less water flowing in the system under this property than the requested 309,600 gpd. The report assumes that 11 inches per year of rainfall infiltrate the ground and that 75% of this recharges the bedrock. The source water protection area (SWPA) of figure 3-15 is assumed to be the limit of the footprint of land that supplies water to the production wells (upgradient areas). If this recharge rate is correct, then this should be at least the groundwater flow rate under the site as reflected in piezometric maps and flow nets. Looking at the 80 % of the SWPA which is the USA property and lands to the northwest (the land area that is now sending water, by gravity, in the direction of the USA property), the assumed 11 inches per year of infiltration on this

upgradient SWPA yields groundwater flow under the site of 684,000 gpd in both overburden and bedrock. However at the site, the piezometric head maps (figures 3-10, 3-11, and 3-12), the reported gradients (page 25), and the formation thicknesses (drilling logs in Appendix E) all lead to the reality that much less flow moves under the site than the requested pumping volume as well as the estimated recharge volume. This conclusion is presented in the following two tables that use the data in the Gradient pumping test report to calculate the flow of groundwater under the site at the location of the wells.

Formation	Hydraulic Conductivity (ft/day)	Flow Contour (ft/MSL)	Contour Length (ft)	Saturated Thickness (ft)	Gradient	Flow (gpd)
Shallow overburden	0.63	400	2,800	10	0.03	4,000
Deep overburden	0.35	398	3,000	5	0.025	1,000
Bedrock	0.67	390	3,800	600	0.017	194,000

Total = 199,000 gpd

Formation	Groundwater Velocity (ft/day)	Flow Contour (ft/MSL)	Contour Length (ft)	Saturated Thickness (ft)	Porosity	Flow (gpd)
Shallow overburden	0.085	400	2,800	10	0.3	5,300
Deep overburden	0.085	398	3,000	5	0.3	2,900
Bedrock	0.23	390	3,800	600	0.05	196,000

Total = 204,200 gpd

From these two methods of using field measured contours, hydraulic conductivity, and the flow nets, the ambient flow at this site is about 200,000 gpd. This demonstrates that the upgradient SWPA does not receive the amount of recharge postulated in the report. The method presented here compares the assumed recharge to what is flowing under the site: it does not consider that additionally there would be groundwater from further upgradient that should be moving towards the site. In addition, this demonstrates that the requested pumping of 309,600 gpd exceeds what is available: even when ignoring all other uses of the water. Lastly, this supports why the pumping test did not result in stable water levels in the production wells. If the production well pumping extends drawdown to the southeast of the property, as displayed in the SWPA (note, this is the 20% of the SWPA not included in the last analysis of recharge), this increases the assumed amount of water infiltrating the ground and being captured by the wells, but is still not supported by the field data. If 309,600 gpd is pumped continuously, given that the ambient flow is only 200,000 gpd, the result will be that the water levels in the pumping wells will continue to fall and the overburden and wetlands will be de-watered. Surface waters will be tapped to induce groundwater recharge. Ultimately, when overburden and wetland sources are nearly depleted and induced infiltration is limited by bed sediments or the lack of water, the system will impose self-limiting flows upon the production wells...something less than 200,000 gpd.

A comparison of the pumping of the bedrock wells to the total volume of water in the overburden and bedrock does not address the fact that the effects of dewatering on wetlands

occur at the top of this groundwater system. Regulatory definitions of wetlands include the hydrologic condition that groundwater be within one foot of the land surface for some extended period during the year. If groundwater pumping lowers groundwater levels below this regulatory level, irrespective of how much groundwater is below this level, by lowering the groundwater table, the wetlands are lost. Revisiting the calculations of Table 3-9 of the report, the volume of water represented by the surface area of the SWPA, the overburden porosity, and a lowering of the water table by one foot, is 85 million gallons. If 100,000 gpd of the requested pumping of 309,600 gpd is derived from dewatering the overburden, the 85 million gallons, represented by dewatering the overburden one foot, is consumed in less than 2.5 years. This means that wetlands riparian to the constantly wet areas and within the SWPA will be lost.

Page 26, the statement that, "...the bedrock aquifer: 1.) receives significant recharge from rainfall..." Is not demonstrated by the data, but rather is one interpretation. The other source is regional flow. Other reasons for water level changes in bedrock formations, aside from precipitation include barometric pressure and hydrostatic loading by the recharged overburden. These other possibilities were never explored and therefore cannot be discounted. The conclusion reached in the report is not supported by the data.

Page 27, it is stated that observed groundwater levels were adjusted for barometric pressure then plotted on semi-log paper to determine drawdown at 180 days. Nowhere in the report does the correction for barometric pressure appear. This needs to be explained and highlighted. More importantly, there was never any correction made for the significant rainfall before and during the pumping test itself. These corrections are extremely important in the non-pumping wells and the corrected data form the basis for identifying long term drawdowns as well as the zone of influence. These corrections, for each well, need to be clarified and demonstrated.

Page 27, the statement that the pumped water will not draw on water from storage in the system is contradicted by the large drawdowns (over 300 feet at the wells, and upwards of 40 feet in distant observation wells) displays significant dewatering in the brief pumping test. These will be magnified when considering decades of pumping.

Figure 3-13 does not match the differences in water levels between the bedrock head maps presented in figures 3-12 and 3-14 in the NNW direction. For example, in the northernmost location of the property in Nottingham, the two head maps infer a drawdown of about 60 feet, yet figure 3-13 indicates that there will be no drawdown just a little further north (below wetlands W21). In addition, based on the well monitoring data, the drawdown estimates westward along Old Turnpike Road end closer to the pumping wells than reasonable. Drawdown will extend further westward along Old Turnpike Road than represented in Figure 3-13.

The predicted drawdown influence zone in figure 3-13 in not consistent with the fabric fracture analysis (figure 3-8). Page 27 and figure 3-13, looking at the rose diagram of fracture sets and the estimated zone of influence, the absence of wells to the ENE and WSW should not limit the size of the estimated zone of influence. Meaning that if drawdown could not be observed in these directions because there were no observation wells, this does not mean that drawdown does not occur in these regions. The pumping influence (manifested as drawdown) in these directions

can expand hundreds of feet further than drawn, and should be estimated as such. The locations of measured and significant drawdown appear to have occurred in a combination direction of the NW-SE fractures and the ENE-WSW fracture sets.

On page 27 it is stated that, "...the presence of a water surplus in the area ensures that the withdrawal will not draw water present in storage." This comment is not supported by the data. As shown previously, the requested withdrawal exceeds ambient flow at the site.

The zone of influence extends over 4,000 feet from the pumping source. Considering this a "relatively small area" (page 27) is not an accurate description.

Page 28 "...expected to be no effect on the water supply of downgradient water users." This statement is not supported with calculations. In addition, all site groundwater is headed towards surface water discharge in the Lamprey River system, which is a water supply for downstream communities. This was not discussed in the report.

Page 28 – "...no response is predicted at the New Barn Well..." This is contradicted by the hand measurements from this well in Appendix H-4. The data from this well was also not corrected for precipitation.

Drilling logs indicate that not all bedrock wells had casing extending into competent rock. Driller's logs indicate 10 feet of casing in some bedrock wells after bedrock was first encountered. Weathered/highly fractured bedrock is often 10 to 50 ft thick in the seacoast of NH. Also, glacial erratics can sometimes be perceived as top of bedrock. The end result is that the bedrock wells on this site may appear to be highly connected to precipitation recharge; however most of this relation may be due to well completion in the fractured bedrock. The rational that the bedrock has direct connection to recharge is contradicted by the statement that the system is semi-confined. Along the same lines, the statements that the bedrock is directly recharged from precipitation and yet there will be limited drawdown in till are contradictory.

The report places a high value on the water level measurements of the private, homeowner wells. The construction of these wells may also make such a conclusion suspect due to their possible completion in the weathered rock. Such a completion would make the wells more responsive to overburden changes and therefore not truly reflect solely the bedrock drawdown at that location.

Page 29 states that, "Groundwater elevation data...during the withdrawal test...have also defined the recharge mechanism" The report concludes that since the precipitation that occurred during non-pumping times was succeeded by significant increases in bedrock water levels, that precipitation quickly recharged bedrock. However this is contradicted by measurements of overburden hydraulic conductivity and the vertical distance recharge would have to move to get to the bedrock. It would take weeks to months for precipitation, which infiltrated the till, to move vertically downward to the bedrock. In addition, the storage coefficient for the bedrock indicates a confined formation, meaning that it is surrounded (above and below) by relatively impermeable materials.

The first bullet on page 30 states, "A large portion of the site and its vicinity is located in a lowland valley area, where a relatively high recharge is expected." This statement is contradicted by the field measurements that show the lowland areas to be groundwater discharge locations. It is my experience that in the seacoast of New Hampshire, lowlands are generally groundwater discharge locations for both overburden and bedrock. This bullet goes on to state that, "...the hydraulic conductivity value for the till deposits encountered at the Site was relatively high...This would clearly justify an upper-bound value for recharge." This statement and the entire bullet are based on supposition, and are contradicted by the flow nets in the report that describe much less flow in the system than the assumed recharge.

The water budget calculations of tables 3-9 and 3-10 (and referenced on page 31), especially table 3-9, are used to conclude that significant amounts of water recharge bedrock. Table 3-9 indicates that, on average, 641,000 gallons per day recharge the bedrock in the source water protection area. However, this is contradicted by the flow net, and calculations of bedrock flow from the flow net. Table 3-9 is based on an assumption that 75% of the water that infiltrated the overburden recharges the till. The flow nets and hydraulic conductivities were based on field measured data and are considered more reliable than the water budget calculations.

Page 32, "Groundwater sampling was conducted at the site and its vicinity to: define baseline groundwater quality in the Study Area (prior to the pump test)..." Although sampling was performed prior to the pumping test, analysis of the samples was not, and therefore baseline groundwater quality was not known prior to the pumping test as stated. If such baseline data was known prior to the pumping, the existence of the contamination should have halted the performance of the pumping test.

Page 32 and Table 3-11 describe the water quality in the pumping wells. The report comments that, "the quality of water obtained at the USA series wells is good..." whereas table 3-11 shows that the MCLs for drinking water are violated quite often. In addition: the MCL for Mn is exceeded, the water possesses hits of VOCs, gross alpha is high, and total coliform bacteria were consistently present. These issues need to be addressed.

Page 34 states that, "the water-bearing fractures at the USA wells, "...are present at considerable depths below ground surface...thus, the water bearing fractures are naturally insulated ...from the groundwater quality impacts identified in the shallow overburden..." The identified fractures (from the drillers logs) in the USA wells are deep, however the fracture analysis presented in Appendix C of the July 18, 2002 Gradient Corporation report also indicates that fractures can be very steeply dipping, and therefore there is a real likelihood that such deep fractures in the USA wells connect directly to the overburden within the source water protection area. Additionally, if the report hypothesis is true that bedrock is rapidly recharged by precipitation, then there is no insulation from overburden contamination.

The hydraulic barrier system proposed on page 34 does not have sufficient detail to prove that it will be effective. There are no pumping rates, no well locations, and no estimates of consequences. It is stated that, "...a groundwater mound in the area of groundwater injection, thus creating two barriers that would isolate the USA wells from the affected groundwater." This describes a system where basically a wall (hydraulic barrier) is created that prevents the

drawdown from the USA wells from reaching beyond it towards the contamination. Conceptually this may work, but the concept needs much more detail and study before it can be implemented.

In Appendix H, the estimated drawdown for wells USA-1 and USA-2 appear unsustainable. The plots are steep, and are predicted to come close to the identified water-bearing fractures. The estimated drawdowns are well greater than half of the well depth; a common industry recommended maximum drawdown in production wells is no more than half the water depth in the well. The predicted drawdown in USA-4 is below all but one of the water-bearing fractures identified in the drilling logs. Because of these trends and the fact that there is strong well interference and that the wells did not stabilize during the pumping test, the requested 309,600 gallons per day is unsustainable. Overall, the prediction of the long term drawdown in these wells made in the report is optimistic because the large drawdowns in these wells will accelerate the well losses. This means that the drawdown predictions made in Appendix H, by drawing a straight line on a semi-log plot of drawdown versus time, assume that well losses with increasing drawdowns are constant. This contradicts common understanding of well losses. The increasing drawdown in the production wells with time will be magnified due to the non-linear well loss terms. These non-linear terms could have been developed from the step test data and used to make the long term drawdown predictions.

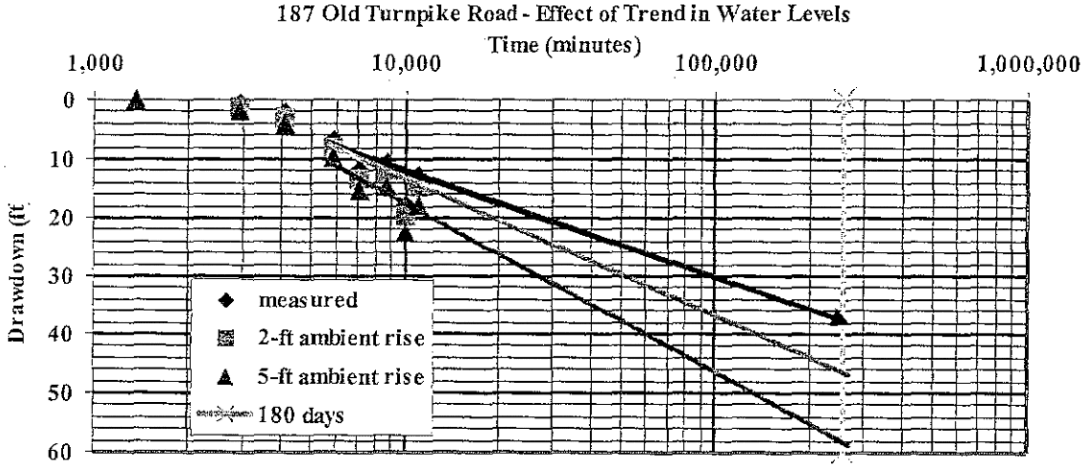
Page 34, the phased start-up of the USA wells is stated to, "...assist with operation of the containment system." This phrase implies that the proposed contaminant containment system is affected by the USA pumping. This is very undesirable. Any containment system should be one not affected by USA pumping; otherwise the integrity of containment is called into question.

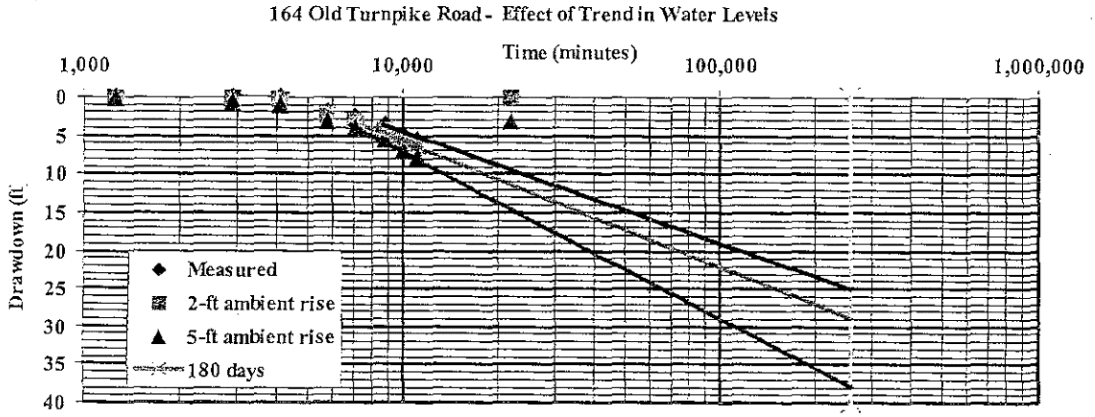
Figure 3-13 does not agree with fig 3-14, especially when employing the rose diagram. The zone of drawdown is underestimated

Derivative-drawdown plots do not reveal a signal of leakage, meaning that the monitored bedrock wells do not exhibit stabilization due to another accessible source of water (fast drainage of overburden or "flow by" water from upgradient sources). Drawdown was monitored in overburden and wetlands wells. Thus the interpretation of the bedrock well derivative drawdown data signifies that the system was continuously dewatering during the pumping test and showed no signs of stabilization. This is further evidence that the pumping test flows is unsustainable because it outpaced the rate of recharge.

Page 36 states that, "no to minimal adverse impacts will occur at private wells located within the Study Area." However the data in the report, as well as what was collected prior to the pumping test does not support this. The report makes this conclusion based on the fact that no adverse impacts or effects were reported during the pumping test. Given the fact that the test was performed in late fall and the fact that there was substantial rain before and during the pumping test: during the pumping test, demands on private wells were very low compared to summer months and time periods when water levels are lower. In addition, the report did not factor in the effects of changes in ambient water levels (due to the recent precipitation) on private well water levels during the pumping test. This has a major implication as identified in the following three plots. In monitored bedrock wells far from the USA wells, water levels rose 2 to 5 feet over the

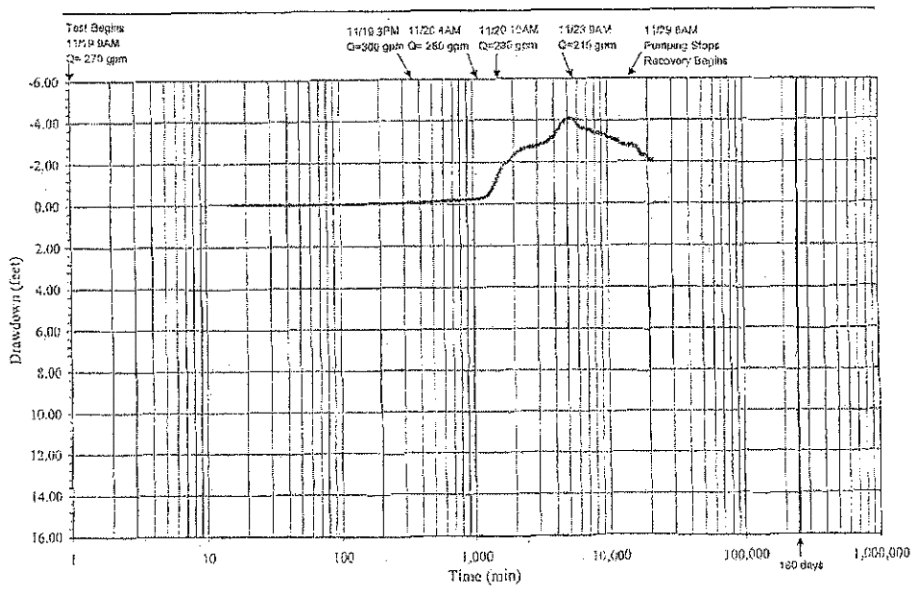
pumping test. If a uniform rise in water levels of 2 to 5 feet is applied to monitored wells that did exhibit drawdown, there is a dramatic difference in the projected water levels at 180 days. In the case of the three wells shown in these figures, the long term drawdown almost doubles. Another reason why adverse impacts and effects to private wells cannot be assessed at this time is because there have been no pumping tests of the homeowner wells. The well yields presented in table 4-1 are generally those provided by drillers at the time of well construction. Such data are often unreliable. All in all, at the requested pumping rate of the USA wells (215 gpm or 309,600 gpd), no conclusion at this time can be reliably made that adverse impacts to private wells will not occur. Wells along Old Turnpike Road seem particularly at risk for this pumping rate. The solutions proposed to mitigate these effects may not work. In addition, the large drawdowns in these wells will require these residents to pay more in energy costs to pump their water (not only to lift the water, but due to lower pump efficiency by operating at lower efficiencies). These are adverse effects that also require mitigation. Existing pumps at these homes may not be sized to yield as much water given the added drawdown





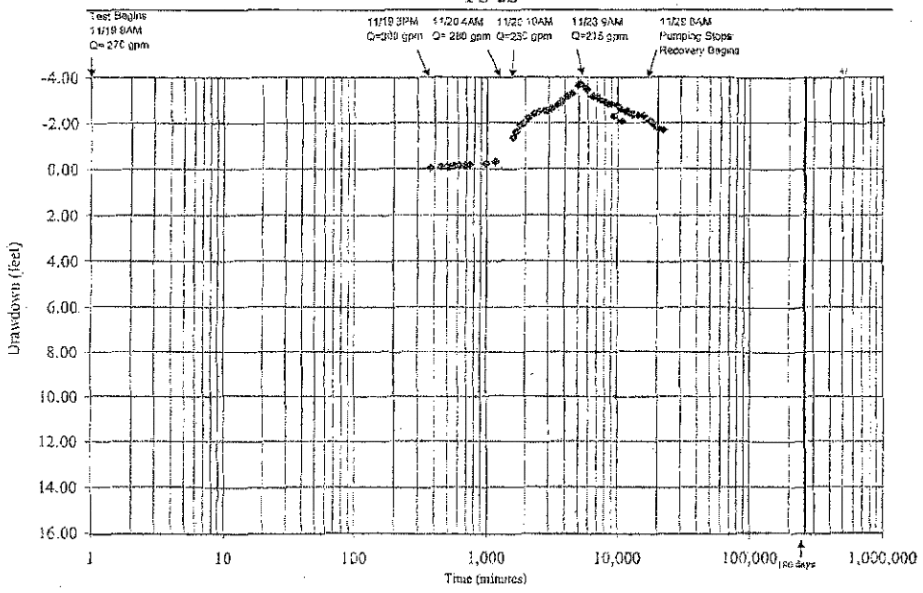
declines in these wells were discounted as being affected by the pumping because they were not exhibiting drawdown (page 36, " ...no response was recorded at 77% of these piezometers...") The data in fact describe just the opposite in light of the fact that there was significant precipitation recorded throughout the pumping test, and especially on November 27. Precipitation was recorded at Concord, NH on: November 19, 21, 22, 23, 25, 27, and 29 (Concord Airport, NOAA, NCDC). This precipitation should have resulted in the listed piezometers displaying constant or continually increasing water levels. Instead, even with the precipitation, the water levels fell in these piezometers, almost continuously after the fourth day of the pumping test. By discounting the effects of precipitation, the estimates of overburden and wetland drawdown (reported to be 0.5 to 2.0 feet, page 36) are underestimated. The following three figures display the fact that waters levels declined in shallow overburden wells, even with significant rainfall on November 27. The last of the three figures shows how there was no correction for precipitation in the analysis of well water level data. The estimated drawdown predicted at 180 days from this figure (well P-3S) is what appears on figure 3-18 in the report.

On-Site Well Groundwater Drawdown Analysis with Pressure Transducer Data
P-2S

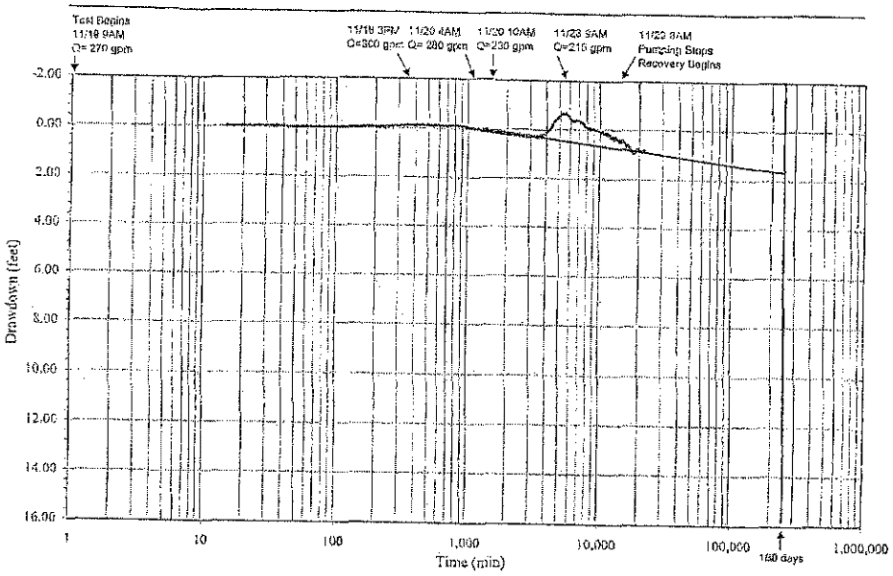


Gradient CORPORATION

On-Site Well Groundwater Drawdown Analysis with Manual Measurement Data
PS-2S



On-Site Well Groundwater Drawdown Analysis with Pressure Transducer Data
P-3S



From the water quality data, looking at the TOC and sulfate concentrations in wells, it can be concluded that USA-1 was influenced by surface water during the pumping test.

Attendant to the discussion on the effects to wetlands is that there was no wetland monitoring data presented for wetland W21 or C1 (figure 1, Appendix D). These wetlands are identified in many of the report figures (for example, figure 1-1) that used the USGS topographic map as the backdrop as well as Appendix D. It is more probable than not that significant bedrock drawdown will occur under wetlands W21 and C1 and therefore this wetland will also see dewatering under a proposed pumping rate of 309,600 gpd. (See comment about the predicted bedrock drawdowns, figure 3-13 and the source water protection area.)

The wetlands leakage analysis (page 38) compares groundwater inflows (for one pond) to the volume of water in the pond. This comparison is used to support the position that pumping 309,600 gpd will not affect the pond. However this analysis does not support or deny the pumping rate. A continuous loss of water ultimately will dry-up the pond, just as evaporation will dry-up a glass of water on the kitchen counter: the evaporation process in this case is slow, but continuous. In order to more accurately assess the effect of the groundwater pumping on the loss of groundwater inflows to wetlands and ponds, a complete, long-term hydrologic budget is necessary. The most important conclusion to be drawn from the discussion in the report is that the area under consideration, under a pumping of 309,600 gpd, will no longer be a groundwater discharge area.

The predicted source water protection area of figure 3-15 looks close to appropriate in the NW-SE direction and is most likely very underestimated in the E-W directions. This conclusion is based on the lack of bedrock well information in these directions, the fracture fabric analysis, as well as the misinterpretation of the shallow well data during the pumping test.

The report proposes long term monitoring of particular private wells and onsite wells. There also needs to be an action plan for this data. The action plan would describe what to do in the event that certain drawdowns occur. For example, if the drawdown in well OW-2 exceeds 10 feet, then pumping will be reduced by 50% and an increased monitoring frequency will occur.

The report made no mention of long term monitoring for water quality, especially given the fact that contamination was found in onsite wells and is suspected offsite and upgradient of the pumping wells. If any pumping rate is permitted on this property, a long term monitoring plan is warranted for the production wells, monitoring wells at the property boundary, and any remediation strategies. In addition, an action plan needs to be developed such that when future water quality data is available, certain concentrations will lead to certain actions, for example, concentrations exceeding AGQS in monitoring wells trigger reductions in pumping rates and increased sampling frequencies.

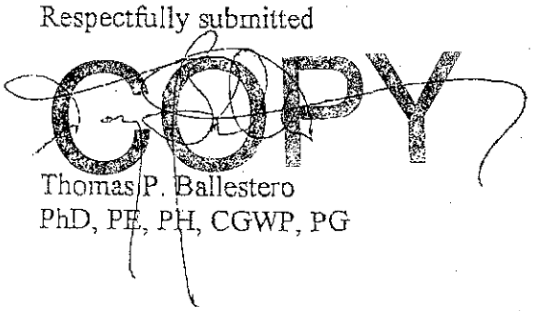
Volume III pumping data needs to be synthesized to plot the cones of depression in the bedrock and overburden formation.

The report neglected to identify how the proposed pumping will reduce flows to the Lamprey River system and subsequent effects. The Lamprey River is a water supply for downstream communities. In low flow times, the flow in the Lamprey is already of concern to these communities.

Commentary

These comments were made based upon my initial analysis of the pumping test report. Additional comments will be issued after synthesizing former reports and correspondences with the pumping test report.

Respectfully submitted



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July 15, 2003

Hand Delivered
Mr. Anthony Giunta
NHDES
PO Box 95
Concord, NH 03302-0095

RE: Town of Nottingham's Public Comment on U.S.A. Springs' Large Groundwater Permit Report and Application

Dear Mr. Giunta:

As you know, this office represents the Board of Selectmen of the Town of Nottingham. I have attached the Board's prior comments dated March 14, 2003 and the comments submitted at that time by the Town's consultant, Professor Thomas Ballestero. I have re-submitted these comments with a summary of salient points for your convenience. The U.S.A. Springs application was first submitted in draft form in April of 2001 and has been revised and changed a number of times since then. The changing nature of the application and the inconsistencies contained in it have made commenting quite difficult. Surprisingly, despite the passage of two years since the inception of this process, a number of issues remain unresolved. Therefore, the Nottingham Selectmen believe the application in its present form should be denied. The unresolved issues are summarized as set forth below. Please note that these issues and others are dealt with more extensively in comments submitted by the Board of Selectmen and its consultants in the materials attached dated March 14, 2003 and in previous comments which are contained in the record of this proceeding.

1. The requested pumping rate of an average of 309,600 gallons per day and peak rate of 475,000 gallons per day has not been justified as a safe sustainable yield.

As pointed out on numerous occasions by Professor Ballestero and other commentors, the data from the February 3, 2003 report suggests that there is insufficient ambient flow to support the withdrawal levels requested. As noted, the amount and nature of the data developed for the report is insufficient in itself to understand the recharge mechanism and the zone of influence. Nevertheless, taking the data on its face, even considering these limitations, the data do not support the pumping rate requested. Additionally, there is no explanation as to why a peak rate of 475,000 gallons should be even considered given the fact that 309,000 gallons per day is not justified.

2. The applicant has failed to show a need for the requested rate.

As has been pointed out by many commentors, the groundwater is a public resource and property owners such as U.S.A. Springs are entitled only to reasonable use based on the balancing of needs of others and the environment. The applicant has failed to explain why there is a "need" for such a high level of withdrawal. The requested withdrawal rate clearly exceeds the through-put capability of its project even if one assumes that the applicant's portrayal of the capacity of its project is accurate. The actual capacity of the applicant's project is substantially less than it has portrayed, as demonstrated by the practical limitations presented by the Board of Selectmen's expert, Robert Duval, concerning transportation limitations and hours of operation.

3. Failure to address DES comments dated April 11, 2003.

The Board of Selectmen have followed the communications between DES and the applicant to determine whether the applicant provided reasonable responses to DES's requests for additional information. DES has provided numerous requests for additional information throughout this application review process. Most recently, DES provided extensive comments and requests dated April 11, 2003 (consisting of twelve pages) on the February Pumping Test Report. In our review of the public file, there is no indication that U.S.A. Springs responded to any of these twelve pages of requests. Unless adequate information is provided by the applicant in response to these requests, the permit should be denied. Additionally, the Board of Selectmen of Nottingham should have an opportunity to review the applicant's responses to DES's comments and to respond, if necessary. Thus, the Board of Selectmen requests a period of 30 days to respond following any further submissions by the applicant.

4. The applicant has failed to demonstrate that its proposal will not have adverse impacts.

The report demonstrates that pumping at the requested rate (and below that rate) will affect the migration of contamination on the adjacent property currently owned by Just Cause Realty Trust. While the applicant has suggested that it will develop a mechanism to control this migration of contamination, to date it has failed to provide any proposal to prevent adverse impacts from the spread of contamination. Additionally, the report identifies pumping at the requested rate will have impacts private wells, on adjacent prime wetlands in Barrington, New Hampshire, and the Lamprey River. Despite this data, the applicant has failed to provide any plan for controlling or mitigating these wetland impacts.

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Massachusetts Office: 45 Milk Street, 5th Floor, Boston, Massachusetts 02109 [617] 778-7500 Fax [617] 778-7501

5. Financial responsibility.

Any large groundwater withdrawal permit which is issued by DES places upon the permittee a legal requirement to comply with the long term monitoring conditions and to assure the response to and correction of any adverse impacts which may occur. This requires both financial resources and access to consulting services. The Town has become aware that the applicant's property has been attached to the extent of over $232,000.00 by Aries Engineering, Inc., an environmental consultant to U.S.A. Springs. According to the documents on file with the court, U.S.A. Springs has failed to pay Aries Engineering, Inc. for consulting services which it provided to the applicant. The attachment raises an issue of whether the applicant has sufficient financial and other resources to properly prepare and conduct the long term monitoring required of a permittee and to respond with appropriate corrective action as adverse impacts to property owners and/or the environment are identified. Unless the applicant demonstrates the financial responsibility to comply with permit conditions, the permit should not be granted.

6. The project has not been sufficiently defined.

Throughout the application review process, the project has been subject to changes and revisions making it difficult to understand precisely what has been proposed. For example, the project site has been referred to at different times as consisting of 58 acres, 78 acres, or 98 acres. At this time, it remains unclear what is being proposed as the project site. On site, groundwater withdrawal wells have also changed. At present, as the Board of Selectmen understand it, the project now anticipates the inclusion of the "new barn well" which is alleged to have a capacity of 30,000 gallons per day. An unidentified number of groundwater extraction wells have been proposed which will apparently be used to establish a hydraulic barrier to limit the movement of groundwater contamination. None of these wells was included in the pumping test and so their impact on the hydrology of the area is unknown. Further, the hydraulic barrier wells have not been described or designed. There are numerous other inconsistencies contained in the report and the application which need to be resolved, and these inconsistencies are further identified in Mr. Ballestero's comments.

7. Testing conditions were not properly controlled.

As pointed out by Professor Ballestero and DES comments, the data generated in the applicant's report was not properly adjusted to account for precipitation both before and during the pumping test. Unless properly collected data, adequately adjusted for variables, is presented, the application must be denied. The data presented to date does not form a sufficient basis for issuing a permit. Further, the wetlands monitoring used by the applicant was not consistent with DES's recommendations for proper monitoring, which is important due to the proximity of the prime wetland. Both the nature and extent of monitoring is thus insufficient to support any

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conclusions regarding wetlands impacts. Finally, as indicated in comments of both Professor Ballestero and DES, the data available is insufficient to accurately identify the zone of influence or the well-head area.

8. There has been no adequate public hearing held to evaluate the impact of the project on the Barrington prime wetlands as required under R.S.A. 482-A.

Early on in the proceedings on this application, the Nottingham Board of Selectmen and others pointed out to DES that the proposed large groundwater withdrawal constituted activity which may have an adverse impact on a prime wetland in Barrington, thus requiring the conduct of a public hearing and a finding by clear and convincing evidence that there will be no adverse impact. (See R.S.A. 482A:11 (IV). In the DES letter to the applicant dated January 26, 2002, DES identified at page 4 and 5, the requirement that the applicant provide clear and convincing evidence that there will be no impact on the prime wetlands located in Barrington immediately adjacent to the site. Although the Board of Selectmen requested that a prime wetlands hearing be scheduled on a number of occasions, it was advised by DES that it was premature to schedule a prime wetlands hearing on those occasions.

On June 12, 2003, DES, for the first time, advised the municipalities interested in the application that, in DES's view, even though the zone of influence of the large groundwater withdrawal includes a prime wetland, no hearing is required under the provisions of R.S.A. 482-A:11 (IV). Accordingly, June 12, 2003 was the first time that Nottingham was informed that DES intended that information regarding prime wetlands should be raised at the large groundwater withdrawal hearings. Nottingham strenuously disagrees with the DES's interpretation of the statute, and since information about the impacts of the project on prime wetlands was not available until the February 2003 report, comments relating to prime wetland impacts could not have been submitted at previous hearings. Accordingly, the Board of Selectmen believes that DES has not provided the public, or other parties, with an adequate opportunity to address the impact of the project on prime wetlands. Our view is that since a large groundwater withdrawal will clearly have an impact on the Barrington prime wetland, a public hearing is required and the applicant has the burden of proving by clear and convincing evidence that there will be no adverse impact on the values of the prime wetland as required by statute.

Additionally, DES, as part of its permit findings, is required to find by clear and convincing evidence that the large groundwater withdrawal will not have an adverse affect on the

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values of the prime wetland. Based upon the information presented to date in support of the application, there is insufficient evidence for DES to make such a finding with regard to this application, and so the application for a large groundwater withdrawal must be denied.

Very truly yours,

for E. Tupper Kinder

ETK/ljt:sma
Enclosure
cc: Michael Nolin, Department of Environmental Services
Harry T. Stewart
Brandon Kernan, P.G.
Mark E. Beliveau, Esquire
Gregory H. Smith, Esquire
Richard W. Head, Esquire
Armand M. Hyatt, Esquire
Town of Barrington
Town of Northwood
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Salient Points Resulting from the USA Springs Pumping Test
Thomas P. Ballestero
8 July 2003

1. No pumping should be permitted until more is known of onsite and offsite contamination.

There is now known overburden and bedrock groundwater contamination in violation of regulatory levels. The drawdown for the brief 10 days of pumping caused tens of feet of drawdown under the contamination. No studies to date have delineated the source, extent, and pathways of the contaminants. Given these facts, any request for groundwater pumping must be denied until: a.) more is known about the contamination, b.) a remediation strategy has been designed, implemented, and proven to function appropriately, and c.) it can be demonstrated that the groundwater pumping for a bottling plant (or any other commercial/industrial use for that matter) does not interfere with the remediation strategy or effect plume movement.

2. There is insufficient ambient flow at this site to support the request to pump 309,600 gallons per day (gpd)

The consultants report estimates groundwater flow under the site as over 600,000 gpd. This estimate is based on an unsupported estimate of infiltration. Hydrogeologic data in the report demonstrates that the total groundwater flow under the site is about 200,000 gpd. Many of the onsite and surrounding wetlands depend on this flow for their very existence: the consultants report estimated the flow from the overburden to just a small area of the Barrington Prime wetland to be 1,600 gpd. When considering all wetland area within the same perimeter of the pumping wells as the Barrington Prime wetlands, these wetlands need to be supported by both overburden and bedrock flows: there is insufficient flow in the overburden alone. The requested pumping rate of 309,600 gpd far exceeds the amount of water that now flows under the site. A sustainable pumping rate is one that is less than the total ambient groundwater flowrate minus the needs of existing individual downgradient homeowners, potential, homeowners, and wetlands. The projected sustainable rate should also consider future upgradient uses. The requested volume of 309,600 gpd is very large compared to ambient flow; in fact the request exceeds ambient flow without considering any other uses. This highlights that the estimates of bedrock recharge by precipitation, presented in the report, are also overestimated.

3. The bedrock groundwater recharge mechanism is poorly understood

The consultants report on the pumping test provides contradictory positions on recharge. One position is that substantial recharge from precipitation occurs. This position is not supported by documented information from this site. The other position is that the overburden is relatively impermeable. This position is used to support the hypothesis that overburden wetlands will not be dewatered by bedrock groundwater pumping. No pumping should be permitted until these issues are resolved. The consequences of permitting the groundwater withdrawal without this information include dewatering of wetlands and adverse consequences to homeowner wells.

4. Any strategy to control the movement of contaminants requires a detailed plan and must be demonstrated prior to its implementation

The proposal to employ a hydraulic strategy to avoid drawing overburden contaminants into the USA wells describes a system where basically a wall (hydraulic barrier) is constructed

that will prevent the drawdown from the USA wells from reaching beyond it towards the contamination. Water is to be pumped from one side of the wall (the contamination side) to the other, and treated before being re-injected into the ground. Conceptually this may work, but the concept needs much more detail and study before it can be implemented and before any permit is issued. There has been no consideration of alternatives. For example, why not just bottle the water after it is treated, instead of putting it back into the ground? Given present knowledge of the contamination, the maximum allowable pumping rate at this time is one in which the USA wells are pumped such that the pumping does not create significant drawdown below the location of the known and suspected contamination. Such a pumping rate is on the order of 20,000 gpd or less.

5. The zone of predicted drawdown very large, and not accurately portrayed (underestimated) in the Consultants report.

Figure 3-13 of the consultants report delineates an estimated influence zone of bedrock drawdown. Where the zone is drawn by dashed lines are areas where there did not exist well data further from the dashed line. Soon after the very northern end of the Nottingham USA property (north of USA-1), no drawdown is estimated, yet USA-1 is estimated to have 447 feet of drawdown. Considering the fracture fabric rose diagram on the same figure and the fact that groundwater drawdown progresses logarithmically in space, the location of no drawdown is much further north and west of the drawn dashed line. A similar logic can be applied to the west of Old Turnpike Road. Lastly, the solid line to the WSW of the pumping wells should be mapped much further WSW than in the figure.

6. Pumping 309,600 gpd will significantly dewater wetlands

The consultants report did not develop relations between climatic variables (precipitation, barometric pressure) and water level responses. Therefore none of the monitoring well data was corrected for the precipitation that occurred prior to and during the pumping test. This then led to the misinterpretation that shallow wells were not affected by then pumping test. In reality, most of the overburden wells exhibited drawdown effects during the pumping test. Wetlands to the NNW and NW of the property were not monitored and therefore no conclusions can be made about dewatering of these wetlands. Significant bedrock drawdown, on the order of tens of feet, did occur in this direction, and therefore there is strong evidence that wetlands in this direction will be tapped for water should the request of pumping 309,600 gpd be granted. Because of the weight of evidence pointing to the fact that the overburden and wetlands will serve as a primary source of water to these bedrock production wells, as well as the law on protecting prime wetlands, an appropriate bedrock pumping rate is one that does not create a reversal in the vertical groundwater flow direction at the wetlands. This means that deep overburden drawdown needs to be maintained at less than 0.5 ft at the wetlands.

7. Pumping 309,600 gpd creates excessive drawdown in private wells

Substantial drawdown was monitored in private wells along Old Turnpike Road. Some homeowners will see tens of feet of drawdown in their wells. This significantly reduces the amount of water in well-bore storage available to these residents. In addition, it will require these residents to pay more for their water since the added drawdown requires more energy to pump the well water. This can also lead to more stress on the pump and higher maintenance/replacement rates. When put together, this is a reduction in the quality of life for

these residents, which is an adverse impact. The report does not address this issue other than to monitor the situation, and at sometime address problems when they arise. There is ample data to see that these adverse effects will happen at 309,600 gpd. The applicant has not demonstrated the yield capabilities of affected homeowner wells and therefore cannot technically comment on adverse impacts to homeowner wells as defined in the large groundwater withdrawal regulations. The applicant relies on homeowner complaints for determination of adverse impacts. No pumping should be permitted until the maximum drawdown on these abutters is established. This maximum drawdown is that drawdown that results in the adverse impacts defined by the law, and including some factor of safety.

8. The monitoring plan is inadequate to address the issues and complexity of this site

The proposed monitoring plan has two components: water levels and wetlands. It does not have a water quality component, however due to the discovered contamination such a component is warranted. There are too few wells included in the plan for water levels: more of the existing wells need to be included, new wells need to be installed in the WSW and ENE directions, and more overburden wells should be included, for many of the reasons listed previously.

9. The application to pump 309,600 gpd did not address consequences to surface water supplies.

The majority of the source area and zone of influence for the pumping wells resides in the Lamprey River watershed. It is very likely that the natural discharge of the bedrock water to be pumped by the USA Springs wells was originally destined for the Lamprey River. There has been no assessment of the consequences of this groundwater pumping proposal on the river and existing downstream users of surface water.

10. As the application now stands, predictable consequences and high uncertainty require either denial of the request or severe limitations to the amount of pumping.

Bedrock groundwater flow, dewatering of wetlands, significant lowering of water levels in homeowner wells, reduction of low flows in rivers that serve as water supplies, and existing groundwater contamination all provide for significant uncertainty. The data demonstrate that there is insufficient ambient groundwater flow beneath the property to support the requested amount.

D

Comments on the 12 August 2003 USA Springs Submittal
Thomas P. Ballestero

29 October 2003

Overarching Issues

1. There is Insufficient Groundwater at the Site to Support the Request

The report detailing the pumping test provides estimates of groundwater velocities, hydraulic conductivities, gradients, and flow nets for both overburden and bedrock formations. These data can be synthesized to estimate that the ambient flow moving under the site in the overburden is about 5,000 gallons per day (gpd) and in the bedrock 194,000 gpd. The source of this water is infiltration onsite and regional groundwater flow from upgradient locations. These ambient flows are substantially less than the requested pumping rate. It also underscores why such dramatic drawdowns were observed during the pumping test (indicative of dewatering) and why the pumping wells did not reach equilibrium pumping levels. This demonstrates that the requested amount is unsustainable. This same report estimated the flow from the overburden to a small area of the Barrington Prime wetland to be 1,600 gpd. When considering all wetland area within the same perimeter of the pumping wells as the Barrington Prime wetlands, these wetlands need to be supported by both overburden and bedrock flows: there is insufficient flow in the overburden alone. The reality is that the requested pumping rate of 309,600 gpd far exceeds the amount of water that naturally flows under the site. A sustainable pumping rate is one that is less than the total ambient groundwater flowrate minus the needs of individual downgradient homeowners and wetlands. The projected sustainable rate should also consider future upgradient uses. Such a rate, based on the data presented here, should only be a portion of the 200,000 gpd currently flowing under the site. What should be underscored here is that these estimates of ambient groundwater flow were developed by employing the data available in the pumping test report. The requested volume of 309,600 gpd is very large compared to ambient flow; in fact the request exceeds ambient flow without considering any other uses. This highlights that the estimates of bedrock recharge by precipitation, presented in the report, are also overestimated.

2. The Bedrock Groundwater Recharge Mechanism is Poorly Understood

The pumping test report concluded that since the precipitation that occurred during non-pumping times was succeeded by significant increases in bedrock water levels, that precipitation quickly recharged bedrock. Unfortunately this same report ignores how such recharge occurs in the bedrock and where the water is stored. The report is also silent on the travel time of the recharge: how long does it take rainfall that infiltrates the ground to actually reach the bedrock? The hydraulic conductivity of the overburden materials dictates very slow percolation rates. The bedrock piezometric surface is above the top of the bedrock. This means that the bedrock is a confined system: the pore spaces are already filled with water. This fact is reflected by the storage coefficient that can be developed from the pumping test data ($S = 4 \times 10^{-4}$). The

applicant does not report or discuss the storage coefficient in the pumping test report nor the additional comments delivered on August 12, 2003. In the confined bedrock groundwater system, any increase in the piezometric surface is water that is stored in the storage coefficient: compressibility of water and elasticity of the rock fractures. The data from the pumping test yields a storage coefficient of 4×10^{-4}. Therefore when it is reported that during the antecedent pumping test monitoring period that 5.4 inches of precipitation resulted in an average rise of 2.9 ft in the piezometric surface for the bedrock groundwater (page 31 of the pumping test report), the average bedrock piezometric surface rise per inch of precipitation is 2.9 ft./5.4 inches = 0.54 ft/inch. Over the year (average precipitation of 46 inches per year - page 30 of the pumping test report) this represents (4×10^{-4}) x 0.54 ft/inch x 46 inches = 0.01 ft / year of bedrock recharge = 0.12 inches per year of bedrock recharge. This does not even come close the value of 8 inches per year that was used in the pumping test report (page 31 of the pumping test report). The value of 8 inches per year is an unverified assumption. The value of 0.12 inches per year is developed from data collected and reported by the applicant for the site. This underscores the fact that precipitation recharge does not rapidly occur at this site, and that the delineated source contribution area (the well head area) is underestimated.

A more accurate method of determining how much and how fast precipitation reaches the bedrock is to use chemical fingerprints, especially those that can assist in aging the bedrock groundwater. In my experience in the seacoast of New Hampshire, bedrock groundwater is very old, and on the order of thousands of years old (groundwater dating with environmental isotopes). All the field data point to a very slowly recharged system and that the pumping test resulted in significant dewatering of the bedrock and capture of water from wetlands.

Items Specific to the Appeal Enumeration

Section 1.0 Conceptual Model

Response to NH DES Comment 1 – Instead of attempting to compare evapotranspiration to precipitation, USA Springs continues to believe that 180-day no recharge requirement is conservative. It is reported that adjustments for precipitation during the pumping test were made, but are not reported in this section. The adjustments are concluded to be minor, yet no supporting documentation is given in this section.

Response to NH DES Comment 2 – USA Springs continues to rely on their estimate that there is a water surplus. The reality is that none of the USA Springs wells reached a steady state (equilibrium) drawdown during the pumping test, and that the formation hydraulic data from the pumping test (transmissivity and storage coefficient) as well as the USA Springs piezometric map reveal that much less water flows under the site than is being requested for withdrawal. There is no water surplus at this site on the order of magnitude of the withdrawal request. The water surplus is a result on paper that stems from unsubstantiated claims of recharge at the site. The field hydraulic data do not support the continuous withdrawal of the requested amount. Long term pumping of the requested amount will result in serious dewatering of the formation, desiccation of

wetlands, and aggravated low flow conditions in streams. Tables 3-9 and 3-10 of the pumping test report use an erroneous value of bedrock recharge to show that there is a water surplus for the SWPA and the study area compared to the bedrock pumping. When the value of 0.01 ft/year of bedrock recharge (previously calculated) is used in these same tables, it is evident that the requested pumping by USA Springs exceeds bedrock recharge.

Response to NH DES Comment 3 – The response did not directly address the NH DES concerns. The USA Springs Pumping Test report does contain serious contradictions in how recharge to bedrock occurs and the nature of hydraulic communication with overburden. The response did not clarify the original pumping test report nor respond to the NH DES criticism. No supporting data was offered to clarify the recharge of bedrock groundwater. Environmental tracers or calculations of vertical flow velocities were not attempted.

Response to NH DES Comment 4 – USA Springs agreed that well interference exists in its pumping wells.

Response to NH DES Comment 5 – The USA Springs response is Attachment I. The conclusion being that the adjustment for precipitation during the pumping test resulted in only minor changes of the initially predicted 180-day drawdown at most wells: on the order of 0.5 to 3.0 feet. Attachment I begins by describing how the pumping test well water levels were adjusted for precipitation. The explanation of the correction factor for each bedrock well is not clear and is confusing. Evidently the change in water level at one bedrock well resulted in the water level corrections for all bedrock wells. This is inappropriate. Unique relationships for each well must be developed from field observations. There is no validation or verification that the proposed method is an accurate representation of the response of ground water levels to precipitation. This fact is manifested in many of the corrected plots of water levels found in Attachment I in which the corrected water levels increase with time during the pumping test. The precipitation corrections for the overburden wells also appear flawed. The failure of the precipitation adjustments in Attachment I are best exemplified by wells: P-1S, P-1D, P-2S, P-2D, P-3S, P-3D, P-6S, P-9S, PS-4S, PS-9S, OW-1, P-8S, P-8D, and PS-3S. All of these wells exhibit increases during the pumping test, and some manifest drawdown due to the pumping test. If the precipitation correction had been performed properly, a well unaffected by the pumping would show a stable water level and a well affected by the pumping would show a monotonic decline in water level. Additional aspects displayed by the Attachment I information is not presented in the USA Springs response, however, the following aspects of the Attachment I information is evident: 1.) Table 3-8 shows remarkable drawdowns for the USA Springs wells, and these drawdowns in comparison to the well depths are unsustainable, 2.) also in Table 3-8, wells DP-1S (in) and DP-1S (out) are indicated to exhibit "No Response Noted During Test", yet figures that follow these statements show that the precipitation corrected water levels declined in these wells during the test, 3.) many of the trend lines to estimate the effects at 180 days with no recharge are not supported by the data and contradict the data (wells P-3S, P-3D, P-7D,

OW-1, and PS-9S), 4.) the trend lines for precipitation corrections oversimplify the relation between precipitation and recharge (wells OW-1, DP-3S, P-8S, P-8D, PS-3S, and PS-10S), 5.) the estimated well yields of table 4-1 are not credible, the drawdowns in subsequent plots (165 Old Turnpike166 Old Turnpike, 4 Merry Hill Road, 9 Lincoln Drive, 186 Old Turnpike, 18 Lincoln Drive, 158 Old Turnpike, 19 Lincoln Drive, 78 Freeman Hall, 4 Lincoln Drive, 24 Lincoln Drive, 71 Wood) represent wells with much lower yields than reported in the table, 6.) the distance drawdown plot was estimated liberally: wells USA-3, 24, 25, and 59 (on the plot) argue for a 180-day radius of influence on the order of 10,000 feet.

Response to NH DES Comment 6 – The water quality data offered in the USA Springs response (Attachment I) is basic water chemistry. The contaminant data was not included. The overburden contaminants that were found in the USA Springs wells from sampling events during the pumping test indicate an overburden – bedrock connection. Such data contradicts the statements in the pumping test report that, "bedrock is insulated or vertically isolated from events that occur on the surface that might cause contamination." As such, the omission of this data and the reluctance to address this aspect of the USA Springs conceptual model evades addressing previous NH DES comments, and is non-responsive to these concerns that the conceptual model put forth by USA Springs, the source of bedrock groundwater recharge, and the potential long term supply of bedrock groundwater.

Section 2.0 Groundwater Withdrawal Test Assessment

Response to NH DES Comment 1 – The USA Springs response is that a precipitation correction was applied and does not change the original conclusions. {See comments on page one of this document...Section 1.0 Response to NH DES Comment 5}. The comment is again made that the precipitation adjustment resulted in "0.5 to 3.0 feet". It should be underscored that differences of this magnitude are extremely significant at the radius of influence (the location where zero drawdown is expected). This point should have been directly addressed in the USA Springs response, but was not. Barometric pressure adjustments were claimed to be made, but were not presented or described. No barometric data was offered. A CD data set was referenced, but this CD was not available to this reviewer. It seems likely that the barometric adjustment described by USA Springs is not to groundwater levels, but the adjustment to the pressure transducers for their reading of water level....this is not the same as an adjustment to the water level that was recorded. Finally, although NH DES, this reviewer, and the USA Springs consultants all noted a large leak in the piping system at the wellhead during the pumping test, and the fact that NH DES specifically requested in their comments that this be addressed, the USA Springs response is silent on the issue.

Response to NH DES Comment 2 – USA Springs offers a table of corrected drawdowns for the overburden wells and the USA Springs bedrock wells (table 3-8). The issue of correction due to leakage was left to "proposed future monitoring."

Response to NH DES Comment 3 – USA Springs presents revised figures to address the NH DES comment. These figures (zone of influence and source water protection area) suffer the same omissions and errors as in the original pumping test report: 1.) the zone of predicted drawdown ignores the fracture fabric rose diagram on the figure, 2.) the absence of wells in the north, east, west, and south directions is not justification to limit the zone of influence, 3.) information about contributing area (such as figure 3-13) is not similarly presented for the overburden.

Response to NH DES Comment 4 – Data was submitted on a CD, unavailable to this reviewer.

Response to NH DES Comment 5 – The USA Springs response is revised figures. The distance drawdown plot was estimated liberally: wells USA-3, 24, 25, and 59 (on the plot) argue for a 180-day radius of influence on the order of 10,000 feet. The absence of wells in the north, east, west, and south directions is not justification to limit the source water protection area.

Response to NH DES Comment 6 – The USA Springs response is that their conclusions are based on the anisotropy of the bedrock. The reality is that the absence of wells does not support or contradict their conclusion. This is especially true to the north and east. One possible explanation for the zone of influence being close to the USA Springs wells, north and east of the wells, is recharge from the wetlands. But this possibility was not explored in the response. The data of figure 3-16 supports such recharge from the wetlands.

Response to NH DES Comment 7 – USA Springs, in a fashion, admits that the weirs were not accurate, but then conclude that there is no effect of withdrawal on Prime Wetland #40. This conclusion is unsupported, especially in light of figures 3-16 and 3-18, which predict substantial drawdown under this Prime Wetland. Also, given the fact that the precipitation correction for many of these wells is suspect, the real drawdown at this location certainly may be much more than displayed in these figures.

Response to NH DES Comment 8 – No comment.

Response to NH DES Comment 9 – No comment

Response to NH DES Comment 10 – No comment

Response to NH DES Comment 11 – No description of purge water fate. EPA protocols should be referenced. Data on CD could not be reviewed.

Response to NH DES Comment 12 – No comment

Response to NH DES Comment 13 – No comment

Section 3.0 Wetland Impact Assessment

Response to NH DES Comment 1 – The USA Springs response is that wetlands responses to pumping are best assessed after the permit is issued and with a monitoring program. This response is categorically rejected. There are definite responses in the wetlands during this brief pumping test. These responses will be magnified during extended periods of little to no recharge. The time to address these known consequences to the wetlands is now, not after a permit is issued. Figures 3-16 and 3-18 predict substantial drawdown below wetlands. There are potentially other wetlands, which were not monitored during the pumping test, which will also exhibit drawdown. Clearly the wetlands will be required to supply water to the USA Springs wells should the requested amount be permitted and subsequently pumped. Given the fact that wetland dewatering is not addressed by USA Springs, the application should be denied. Under no circumstances should a permit be issued at a rate that creates measurable predicted drawdown at the wetlands.

Response to NH DES Comment 2 – Electronic files could not be reviewed, however, the USA Springs response did not address the magnitude of wetland well responses, which were the focus of the NH DES comment.

Response to NH DES Comment 3 – USA Springs did not perform an adjustment due to the leakage. More importantly, they did not attempt to quantify the amount of leakage that occurred: they simply admit that it did occur. Given the gravity of the results, this NH Des comment deserves a quantifiable response.

Response to NH DES Comment 4 – The USA Springs response is Attachment II (Monitoring and Mitigation Plan). Bedrock wells are necessary to the north and east, outside of the predicted zone of influence. Section 1 of Attachment II should delineate wells at and near the contamination that are also to be monitored. The wetlands monitoring background (initial survey) needs to occur in multiple seasons for three or more years to establish a credible data set. The monitoring report should be issued at the height of the water deficit season (mid-August) such that potential adjustments to pumping, due to dewatering, occur. The "Study Area" for USA Springs' responsibility to homeowners needs to be delineated on a figure. The 75% reduction in USA Springs pumping (Stage I Management Procedures) needs to be supported, as should be the 50% level for Stage II.

Response to NH DES Comment 5 – The USA Springs response is terse and does not respond to the NH DES request for information.

Response to NH DES Comment 6a – New wetland soil boring data is presented in Attachment I. The referenced site plan locating the new borings was missing. It is not known how this new data was factored into the previous calculations. The USA Springs response in the light of this data was that the original calculations were not modified.

Response to NH DES Comment 6b – USA Springs did not consider the point made by NH DES.

Response to NH DES Comment 6c – The USA Springs response did not attempt to take field data to support their original estimates, and the reference to changes in water levels in overburden wells is unresponsive to the issue. They do not have a verified or calibrated estimate of vertical hydraulic conductivity.

Response to NH DES Comment 6d – USA Springs response is that the precipitation adjustment does not change their original estimate of vertical gradient. As identified previously, the modified figures of corrected well water levels for the overburden wells are seriously in error, and therefore this USA Springs conclusion is suspect.

Response to NH DES Comment 6e – No comment

Response to NH DES Comment 6f – The USA Springs response, as in previous responses, is suspect due to the nature of their precipitation correction.

Response to NH DES Comment 6g – This proposal has been on the table for over one year. USA Springs had the ability to collect and interpret the data and perform the analysis requested by NH DES: they chose not to do so.

Response to NH DES Comment 7 – To this date, no direct measurements exist to respond to the NH DES concern.

Response to NH DES Comment 8 – The USA Springs response is seriously flawed. They have not developed the hydrologic budget for these wetlands and are therefore ignorant of the dominant source of water. Their response implies that it is surface water; however they have no data to support this conclusion. The monitoring well data is convincing that groundwater flow into the wetlands occurs over most of the wetlands and for much of the year. This argues that groundwater is imperative to the survival of the wetlands. A proposed future monitoring program does not counter this fact. It would be irresponsible to allow the reversal of groundwater gradients to prime wetlands through pumping of this requested volume.

Response to NH DES Comment 9 – As with the USA Springs response to the NH DES concern, the rebuttal has also been presented in previous sections.

Response to NH DES Comment 10 – The USA Springs response is that the monitoring plan will address this concern. Again, this is an irresponsible posture for NH DES to issue a permit for requested groundwater production when known adverse consequences were measured and predicted. No such pumping should occur until the applicant proves that such consequences will not occur.

Response to NH DES Comment 11 – The USA Springs response is consistent with the conceptual model that the wetlands will be tapped by the pumping of the requested rate.

4.0 Effects on Current Water Users

Response to NH DES Comment 1 – CD could not be reviewed.

Response to NH DES Comment 2 – No comment.

Response to NH DES Comment 3 – No comment.

Response to NH DES Comment 4 – No comment

Response to NH DES Comment 5 – The USA Springs response to this comment is that the NH DES concern will be addressed after the permit is issued. This is grounds for denial of the permit. An adverse consequence of the pumping has been measured and it is not being addressed other than by gathering information and monitoring. This particular issue must be rectified prior to the issuance of any permit.

5.0 Water Quality

Response to NH DES Comment 1 – The USA Springs response is to address the NH DES concern after the permit is issued. This is considered to be unresponsive and a basis to deny the permit.

Response to NH DES Comment 2 – The USA Springs response is to address the NH DES concern after the permit is issued. This is considered to be unresponsive and a basis to deny the permit.

Response to NH DES Comment 3 – No comment

Response to NH DES Comment 4 – No comment

6.0 Miscellaneous

Response to NH DES Comment 1 – By constructing the zone of influence and source water protection areas the way it did, USA Springs contained effects to within Nottingham. Previous criticism of these estimates have been raised: the absence of wells in the north, east, west, and south directions is not justification to limit the zone of influence or source water protection area.

Response to NH DES Comment 2 – No comment

Response to NH DES Comment 3 – The USA Springs response needs more detail in order to verify that they will not violate local zoning ordinances.

7.0 Future Monitoring, Reporting and Mitigation Requirements

Response to NH DES Comment 1 – No comment.

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FILE COPY

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SATURLEY, PC
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December 2, 2003

VIA FACSIMILE AND FIRST CLASS MAIL
Mr. Michael P. Nolin, Commissioner
NH Department of Environmental Services
6 Hazen Drive
Concord, NH 03301

Re: Application of USA Springs, Inc. for a Large Groundwater Withdrawal Permit and Approval of Bottled Water Source

Dear Commissioner Nolin:

As you may know, this office represents the Selectmen of the Town of Nottingham with respect to the USA Springs, Inc. Large Groundwater Withdrawal Application. I am in receipt of Attorney Smith's letter to you dated November 24, 2003 and the response of the same date signed by Michael Walls, Assistant Commissioner.

My client is troubled by the unusual approach which the Department appears to be taking with respect to USA Springs applications pending before it and the Just Cause Realty matters also pending. As you know, on August 12, 2003, the Department issued its denial of the major groundwater withdrawal and new source of bottled water applications submitted by USA Springs on February 4, 2003. The Department's decision dated August 12, 2003, set forth in great detail its conclusions that the Application Report was incorrect and incomplete and thus the requested applications were denied. Extensive findings were entered.

Subsequently, on or about September 18, 2003, the Department, at the request of USA Springs, suspended its decision and allowed time for the submission of additional information. The grant of rehearing decision set out a clear procedure under which review of the applications and new information would take place. The record on the USA Springs applications was ordered to close on November 10, 2003.

During this period, the Department was also reviewing a Supplemental Site Investigation Report and Supplemental Remedial Action Plan submitted on behalf of Just Cause Realty Trust

LLC. These documents purport to address a contamination condition existing on the Just Cause Realty site the USA Springs' property as well as USA Springs' property which is adjacent.

Although USA Springs and Just Cause Realty Trust are undoubtedly related entities, it is inappropriate for the Department to blur the distinctions between these parties and their separate matters under review. The Department appears to have done this by accepting information submitted relating to the Just Cause site into the USA Springs Large Groundwater Withdrawal Permit Application record even though the USA Springs' record is supposedly closed. I note that the record was closed to comment by the public on October 29, 2003. Comments from USA Springs appear to have been continually accepted even to the present as far as we can tell.

As you can appreciate, this has created much confusion among parties who have an interest in the large groundwater application proceeding. This confusion is heightened because the applicant made a statement (included in Attorney Smith's letter of November 24, 2003). That "the Department has concluded that there clearly is a sufficient quantity of water to approve the application by USA Springs for the large groundwater withdrawal permit and the bottled water source". The Town of Nottingham Selectmen are not aware of any such conclusion and are at a loss to understand how such a conclusion could have been reached in light of the information existing in the record and the Department's findings on the record. If there are conclusions which are not part of the public record, we request notification of those non-record conclusions immediately.

The only conclusions of which the Town of Nottingham's Selectmen are aware are those contained in the Department's detailed denial of the final application report dated August 12, 2003. In its decision, NHDES concluded exactly the opposite i.e. that the applicant had not established that there was sufficient quantity to approve its application. While the effect of the decision may have been suspended during the rehearing process, the findings remain and have not been withdrawn.

The pertinent NHDES summary of findings and decisions in its August 12, 2003 order are as follows:

Summary of Findings and Decisions

1. Conceptual Model

NHDES found that the conceptual model was incorrect and failed to demonstrate that the withdrawal will not produce impacts that can be mitigated. NHDES rejected the applicant's position that pumping could be sustained during normal weather periods. (Decision at 3).

2. Aquifer Storage

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NHDES found that the Applicant's conclusion that there was a "net water surplus" was not supported by data which actually showed that storage was being tapped. NHDES rejected the applicant's analysis of aquifer storage (Decision at 3).

3. Potentially conflicting elements of the conceptual model

NHDES found that the conceptual model contained conflicting descriptions arguing on the one hand that the source water was "insulated" from overburden and on the other hand that it was "quickly recharged" from overburden. Thus, NHDES rejected the conceptual model. (Decision at 4, 5).

14. Impact to wetlands functions and values

NHDES found that the applicant failed to provide a complete and correct assessment of the impact of the demonstrated two-foot drawdown of shallow overburden groundwater, particularly where prime wetlands would be impacted. Decision at 11-14). NHDES rejected the applicant's analysis that pumping conditions would not impact prime wetlands.

20. Private well adverse impact assessment

NHDES found that the observed impact on private wells in the area indicates that the applicant's assumptions of no impact are unsupported. (Decision at 15).

In summary, the status of the Department's findings as of the close of the record (November 10, 2003) in this case indicates that the application should be denied because the applicant has failed to produce an application report which complies with the regulations. The applicant has failed to respond to the points raised in the Department's Decision of Denial and so that decision should be reaffirmed.

Supportive of this position is the fact that the Department has reached conclusions in the Just Cause Realty Trust site. It has determined that "the remedy must be implemented and found to be effective", before any further consideration of the USA Springs' application can take place. The Department properly concluded that the USA Springs application cannot be acted upon until the remedial action plan has been implemented by Just Cause Realty. The NHDES conclusion demonstrates that there is no purpose to leaving the USA Springs' application in limbo pending remediation of the Just Cause site. Any further consideration of the USA Springs' application will require presentation by USA Springs of a new long-term aquifer pumping test and accompanying final report that demonstrates how the remedial system may react to the conditions which USA Springs proposes to implement. In short, USA Springs will have to file the equivalent a new application and new final report in accordance with regulations.

Therefore, the Town of Nottingham Selectmen suggest that the proper way to proceed on the pending applications is as follows:

1. Enter a decision on the USA Springs application for large groundwater withdrawal and bottled water source, first lifting the suspension of the August 12, 2003 decision and then reaffirming the August 12, 2003 decision denying the pending application for the reasons set forth therein.

2. Continue to review the Just Cause Realty Trust remedial action plan design and implementation in accordance with the Department's rules and regulations.

3. Provide regulatory oversight of Just Cause Realty Trust implementation of a remedial action plan to determine the remediation parameters necessary to be effective against the contaminant mass currently existing on the Just Cause and USA Springs sites.

4. At a time when the effectiveness of the Just Cause Realty remedy can be judged acceptable, invite USA Springs to submit an application and prepare final groundwater withdrawal report in compliance with all regulatory requirements (including the establishment of need), which demonstrates through long-term aquifer pumping tests that proposed pumping conditions can be maintained without adversely affecting the remediation system, other aquifers users, and the environment.

This approach is consistent with regulatory requirements and reasonable procedures for the following reasons:

A. It provides appropriate finality of the USA Springs large groundwater withdrawal application (which has been pending for almost 3 years) as required under the regulatory program. There is simply no mechanism for maintaining an application open and in limbo for an extended period of time. This makes practical sense because it is likely that many conditions can and will change during the interviewing period (which could be several years), such as wetland borders, construction activity within the source water protection area, new aquifer users, etc.

B. The regulatory process anticipates a structure for submission of applications, public comment and review. That structure is lost when the Department attempts to stay a proceeding for an undetermined period of time. A stay puts the issue in limbo and requires the applicant and interested parties to continue to review and submit information as they see fit with no regulatory guidelines. This creates a cumbersome and expensive process for the Department, the applicant and interested parties.

C. The practical effect of the Department's determinations to date is that the current final report as submitted by the applicant is insufficient to allow granting of a permit and no application for a permit can be reviewed until the remedial strategy is being implemented and

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until a long-term aquifer pumping test and accompanying report is submitted analyzing the concurrent operator of the remedial action and the proposed withdrawal. This will require a new application and final report by the applicant. There is no reason for a stay of the current proceeding.

In conclusion, while the Selectmen understand the Department's desire to provide a fair and reasonable permit review process, a further stay of its action on the USA Springs' application would do neither. It would relegate the application to a regulatory limbo for which there are no rules or procedures, thus creating confusion, expense and uncertainty for everyone.

Under the circumstances, the best and fairest result would be to deny the pending application for the reasons set forth in the Department's decision dated August 12, 2003.

Respectfully submitted,

The Town of Nottingham Selectmen,
By and through their attorneys,
Nelson, Kinder, Mosseau & Saturley, PC

COPY

Dated: December 2, 2003

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ETK/sma
cc: Selectmen, Town of Nottingham
Selectmen, Town of Barrington
Selectmen, Town of Northwood
Mark Beliveau, Esquire
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Water Availability at the USA Springs Site

In the past months, correspondences from USA Springs (or their representatives) to the New Hampshire Department of Environmental Services has made various references to the fact that USA Springs and NH DES are in agreement that there is substantial groundwater at the site to meet the USA Springs request (e. g., 24 November 2003 letter from Gregory Smith to NH DES Commissioner Michael Nolin, "...the Department [NH DES] has concluded that there clearly is sufficient quantity of water to approve the application by USA Springs for Large Groundwater Withdrawal Permit..."). In The April 11, 2003 NH DES preliminary comments to the USA Springs pumping test report, NH DES did not come to such a conclusion, and this letter specifically requested more detail to support such a conclusion by USA Springs. In addition, in the August 12, 2003 permit denial, NH DES cited, on more than one occasion, that the information presented by USA Springs did not, "demonstrate that the withdrawal will not produce impacts or result in impacts that can and will be mitigated ". Env-Ws 389 does not prescribe for any interim decision on a permit until the application is complete and submitted to NH DES. The August 12, 2003 denial of the request demonstrates that NH DES does not agree with the USA Springs claim of water availability: even in light of the supplemental information submitted by USA Springs on the same day as the denial.

Despite the lack of ideal field data, a very strong case is made by the water level and pumping test data that there is insufficient groundwater and recharge at the site to support the USA Springs request without severe consequences. Five points that demonstrate that there is insufficient water at the site to meet the pumping request follow.

1. The bedrock well water level data prior to the pumping test demonstrated a reaction to precipitation. USA Springs interpreted this reaction to be the direct recharge of the bedrock. However the physical reality is that very little precipitation recharge goes to the bedrock. This is because the bedrock is a confined system: recharge water can only enter storage in the formation by increasing the density of water or by expanding the size of the rock fractures. Therefore a precipitation event of one inch that leads to a bedrock well water level increase of one half foot, is in reality a recharge of only 0.0024 inches. When these calculations are carried out over an average year of precipitation, it is very obvious that the bedrock does not enjoy the 8 inches per year of bedrock recharge claimed by USA Springs, but only a very small fraction (less than 2%). Since the groundwater pumping cannot be met by recharge on the assumed wellhead area, the consequence is dramatic dewatering of the bedrock and nearby wetlands: which were observed during the pumping test

2. The observation well data during the pumping test can be analyzed to yield the bedrock transmissivity. When multiplying this transmissivity times the ambient bedrock groundwater gradient for the depth of the USA Springs wells, it is evident that there is less ambient groundwater flowing under the site than the USA Springs request. This directly refutes the USA Springs claim that they are taking only a small fraction of the water that is flowing by.

** submitted on December 3, 2003

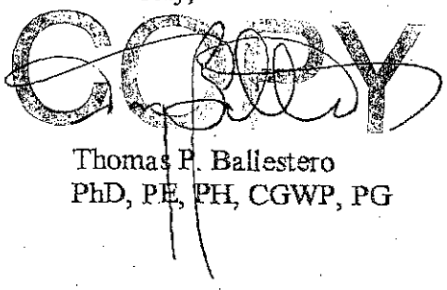
3. The 10-day pumping test, although much shorter than 10 years of pumping, clearly demonstrated a dramatic reduction in the overburden groundwater levels below wetlands. In fact, the ambient vertical gradients below the wetlands displayed groundwater discharge (even during the wet period of the pumping test), and these were reversed by the pumping test. This is clear evidence that the USA Springs request will definitely tap protected wetlands and therefore not simply take groundwater that is "flowing by".

4. The volume of the formation that was dewatered during the pumping test was by far the most significant source of water to the USA Springs wells (figures 3-12 and 3-14 of the 3 February 2003 Gradient Pumping Test Report). The pumping test did not demonstrate that the ambient flow of groundwater under the site exceeds the USA Springs request. The net effect is that the USA Springs request will result in adverse consequences: the only way to satiate the demand is to dewater the bedrock and rob water from wetlands.

5. At the end of the pumping test, the pumping well water levels had still not stabilized. In accordance to Env-Ws 389, the drawdown data is extrapolated to 180 days to reflect a long period of no recharge. 180 days may in fact be too short, since previously (point 1 of this letter) it was shown that a very small amount of bedrock recharge actually occurs. To compound this, the severe drawdown in the USA Springs wells may actually accelerate after 180 days, since drawdowns more than 50% of the well depths may lead to nonlinear well losses.

NH DES is on record in the permit denial letter that USA Springs has not demonstrated that adequate groundwater exists at the site to meet the request. In summary these five technical points, based in the field data collected and provided by USA Springs, demonstrate that there is insufficient groundwater flow at the site to support their request.

Sincerely,



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